

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-307850

(43)Date of publication of application : 23.10.2002

(51)Int.Cl.

B41N 1/08

C25F 3/04

G03F 7/00

G03F 7/09

(21)Application number : 2001-306532

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(22)Date of filing : 02.10.2001

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(30)Priority

Priority number : 2001029232

Priority date : 06.02.2001

Priority country : JP

(54) LITHOGRAPHIC PRINTING PLATE ORIGINAL PLATE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a lithographic printing plate original plate which is excellent in carrying property and fitting property for printing machines.

SOLUTION: For this lithographic printing plate original plate, an image recording layer is provided on an aluminum supporting body which is obtained by applying a surface roughening treatment on an aluminum sheet. The lithographic printing plate original plate is formed into a rectangular cut sheet of which the length in the sheet drawing direction is 600 to 2,000 mm, and of which the width in the vertical direction to the sheet drawing direction is 800 to 1,500 mm. When the cut sheet is placed on a surface plate, the maximum height of a lifted section is 2 mm or lower, the number of lifted sections is three or lower, the total height of the lifted sections is 4 mm or lower on respective vertical edges to the sheet drawing direction. Also, the maximum height of the lifted section is 1.5 mm or lower, the number of lifted sections is three or lower, and the total height of the lifted sections is 3 mm or lower on respective edges being in parallel with the sheet drawing direction.

LEGAL STATUS

[Date of request for examination]

17.03.2004

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's

decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] On the aluminum base material obtained by the aluminum plate by performing a surface roughening process It is the lithography version original edition which prepared the image recording layer. Lay length a plate pressure total 600-2000mm, In each of the side vertical to a plate rolling direction when it places on a surface plate as a cut sheet of the rectangle whose width of face of a direction vertical to the direction of a plate pressure total is 800-1500mm The sum total of the height of three or less pieces and the relief section is set to 4mm or less by the number of 2mm or less and the relief sections, and the maximum height of the relief section sets to each of the side parallel to a plate rolling direction. The lithography version original edition with which the sum total of the height of three or less pieces and the relief section is set [the maximum height of the relief section] to 3mm or less by the number of 1.5mm or less and the relief sections.

[Claim 2] Surface roughness Ra of the direction where surface roughness is [that surface roughness on the back differs in a plate rolling direction and a direction vertical to it] large Ra1 and surface roughness Ra of the direction where surface roughness is small The lithography version original edition according to claim 1 whose values of Ra1/Ras are 1.1-5.0 when referred to as Ras.

[Claim 3] The lithography version original edition according to claim 1 or 2 with which the slight surface roughening process is performed to at least one side of the edge from an edge on the back to 1-50mm.

[Claim 4] The coefficient of thermal expansion of a direction vertical to the plate rolling direction after removing an image recording layer is 1.0×10^{-5} to 2.5×10^{-5} . After considering as the cut sheet of the rectangle each whose die length in every direction it is 80 - 98% of the coefficient of thermal expansion of a direction a plate pressure total, and is 500-1000mm, The lithography version original edition according to claim 1 to 3 with which the sum total of the height of four or less pieces and the relief section is set [the maximum height of the relief section] to 5mm or less in each of four sides by the number of 3mm or less and the relief sections when it heat-treats at 80-270 degrees C, it cools radiationally further and it places on a surface plate.

[Claim 5] The lithography version original edition according to claim 1 to 4 whose Erichsen values after removing an image recording layer are 2-10.

[Claim 6] The lithography version original edition according to claim 5 whose averages of the ratio of the depth to the diameter of opening of this concave pit said aluminum base material has the concave pit on the front face, and the diameter of average opening of this concave pit is 0.6 micrometers or less, and are 0.15-1.0.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the lithography version original edition which is excellent in conveyance nature and printing machine wearing nature in detail about the lithography version original edition.

[0002]

[Description of the Prior Art] Conventionally, the photosensitive lithography version original edition is broadly used for offset printing. In recent years, the platemaking approach of the lithography version original edition of having used laser attracts attention, and many things are examined. For example, the laser lithographic plate of the heat mode method which writes in with the laser lithographic plate of the photon method using the photopolymerization nature constituent hardened with light laser, the heat generated with a laser light exposure is known. It is possible to engrave directly from digital data, such as a computer, by these methods, and it is very useful. The lithography version original edition in which a laser lithographic plate is possible is produced by applying the coating liquid for sensitization layers, drying, and forming a sensitization layer, after carrying out the surface roughening process of the front face of a web-like aluminum plate and performing anodizing further generally. then, the web-like lithography version original edition -- immediately -- or after it is judged by desired size after being kept in the condition of having been wound around the roll, and considering as the shape of a sheet, two or more sheets are piled up and it is packed up. After image baking by laser exposure etc. and a development are performed to the lithography version original edition by which packing shipment was carried out by the user and it is used as the lithography version, it is attached in a printing machine by him and printing is presented with it.

[0003] It is necessary to accumulate the lithography version original edition of two or more sheets cut to an even length in predetermined size with a sufficient precision at the time of packing of the lithography version original edition mentioned above, and to convey at it the lithography version original edition cut to an even length by predetermined size with a sufficient precision for that purpose. Although a band conveyor is used by conveyance, the lithography version original edition may slip to it, and there is usually a problem that accurate conveyance and an accurate pile are difficult in it on a band conveyor. Moreover, although the conveyance belt and the conveyance roller are used also for migration of the lithography version original edition to various processes, such as laser image baking performed in a user, development, and printing, the lithography version original edition slips and there is a problem that accurate conveyance is difficult also on this conveyance belt and conveyance roller. Especially, in laser exposure, since very high positioning accuracy is required, poor conveyance will cause not only the decline in productive efficiency but the image quality fall of a formation image. Moreover, also in a development, the developing machine of an automatic conveyance type is used for the most, and the demand of an improvement of poor conveyance is high also about under development. In order that this invention persons may raise the conveyance nature of the lithography version in JP,2000-141932,A Surface roughness on the back differs in the longitudinal direction and the cross direction of the lithography version, and it is made for the ratio of the surface roughness

of the direction where the surface roughness and granularity of the direction where granularity is large are small to be set to 1.1-5.0. And it proposed performing a surface roughening process at the edge of at least one side on the back over 50mm or less more than 1mm. However, if this approach has a large relief by distortion in each side of the lithography version, it may become inadequate contacting it with a band conveyor etc., and it may not take effect at all.

[0004] Furthermore, in case a printing machine is equipped after performing image baking and a development to the lithography version original edition and considering as the lithography version, it fixes to the drum which bends the both ends and is called the printing cylinder of a printing machine, but wearing may become impossible, if a crack and a crack occur or homogeneity does not bend, in case it bends.

[0005]

[Problem(s) to be Solved by the Invention] This invention aims at offering the lithography version original edition which is excellent in conveyance nature and printing machine wearing nature.

[0006]

[Means for Solving the Problem] The result which this invention person studied wholeheartedly about the relation between the configuration of the lithography version original edition, conveyance nature, and printing machine wearing nature, By adjusting the sum total of the maximum height of the relief section at the time of cutting the lithography version original edition and placing on a surface plate as a cut sheet, a number, and height to the specific range in each of a plate rolling direction and a direction perpendicular to it A header and this invention were completed for the lithography version original edition which is excellent in conveyance nature and printing machine wearing nature being obtained.

[0007] This invention namely, on the aluminum base material (henceforth "the base material for the lithography versions") obtained by the aluminum plate by performing a surface roughening process It is the lithography version original edition which prepared the image recording layer. Lay length a plate pressure total 600-2000mm, In each of the side perpendicular to a plate rolling direction when it places on a surface plate as a cut sheet of the rectangle whose width of face of a direction perpendicular to the direction of a plate pressure total is 800-1500mm The sum total of the height of three or less pieces and the relief section is set to 4mm or less by the number of 2mm or less and the relief sections, and the maximum height of the relief section sets to each of the side parallel to a plate rolling direction. The maximum height of the relief section offers the lithography version original edition with which the sum total of the height of three or less pieces and the relief section is set to 3mm or less by the number of 1.5mm or less and the relief sections. The lithography version original edition of this invention is excellent in conveyance nature and printing machine wearing nature by taking the above-mentioned configuration.

[0008] When surface roughness on the back differs in a plate rolling direction and a direction perpendicular to it and surface roughness (Ra) sets to Ras surface roughness of the direction where Ral and surface roughness are small for the surface roughness of a large direction after stopping the relief within the limits of predetermined as mentioned above, it is desirable that the values of Ral/Ras are 1.1-5.0. In the lithography version original edition of this mode, it has the surface roughness from which a rear face differs mutually in a plate rolling direction and a direction perpendicular to it, and that Ral and Ras have the above-mentioned relation. In case the lithography version original edition of this mode is conveyed with a conveyance belt or a conveyance roller, frictional force which is different in a plate rolling direction and a direction perpendicular to it acts on a rear face. When frictional force which is mutually different in the plate rolling direction of the rear face of the lithography version original edition and the direction perpendicular to it acts, the slip and meandering at the time of conveyance can be prevented effectively.

[0009] furthermore, the case where negatives are developed after image exposure -- setting -- the surface roughness (Ra) of the rear face after a development -- plate pressure -- when surface roughness of the direction where Ral and surface roughness are small is set to Ras for the surface roughness of the direction where surface roughness is large by differing in a direction and a direction perpendicular to it a total, it is desirable that the value of Ral/Ras turns

into a specific value according to a developer. Namely, when negatives are developed with the developer which does not contain an alkali-metal silicate substantially and contains a saccharide It is desirable that the value of Ra/Rs is set to $1.05-4$, and it is desirable that the value of Ra/Rs is set to $1.10-5$ when negatives are developed with the developer containing an alkali-metal silicate. When negatives are developed with the developer which does not contain an alkali-metal silicate substantially and contains ethanolamines, it is desirable that the value of Ra/Rs is set to $1.05-4$. Hereafter, the reason is explained.

[0010] The conveyance belt and the conveyance roller are used [others / at the time of packing of the lithography version original edition mentioned above] for migration of the lithography version original edition in various processes, such as image baking performed in a user, development, and printing, the lithography version original edition slips on this conveyance belt and conveyance roller, and there is a problem that accurate conveyance is difficult. For example, in a development, since the developing machine of an automatic conveyance type is used in almost all cases, the demand of the improvement about poor conveyance in development is high. As a result of this invention person's inquiring wholeheartedly and the surface section of the rear face of the lithography version original edition dissolving in a developer in a development, it turned out that conveyance nature may change and it may become the cause of poor conveyance. Moreover, the thing for which the conveyance nature under development and after a development has the surface roughness (Ra) in the plate rolling direction of the rear face after a development, and a direction perpendicular to it, and specific relation as a result of this invention person's repeating examination further wholeheartedly, And soluble extent of the rear face of the lithography version original edition in a development changed with classes of developer, and said relation also acquired changing with classes of developer for a header and the lithography version original edition of this mode. Therefore, the lithography version original edition of this mode is desirable at the point of excelling in the conveyance nature under development and after a development.

[0011] Furthermore, it is desirable that the slight surface roughening process is performed to at least one side of the edge from an edge on the back to $1-50\text{mm}$. The lithography version original edition of this mode has the field where the surface roughening process of the predetermined width of face was carried out to at least one side of an edge on the back. In case the lithography version original edition of this mode is conveyed with a conveyance belt or a conveyance roller, frictional force which is mutually different to the field where the surface roughening process of the rear face was carried out, and the field by which a surface roughening process is not carried out acts. When frictional force acts on the edge of the rear face of the lithography version original edition greatly, the slip and meandering at the time of conveyance can be prevented effectively.

[0012] The coefficient of thermal expansion of a direction perpendicular to the plate rolling direction after removing an image recording layer is 1.0×10^{-5} to 2.5×10^{-5} . After considering as the cut sheet of the rectangle each whose die length in every direction it is $80 - 98\%$ of the coefficient of thermal expansion of a direction a plate pressure total, and is $500-1000\text{mm}$, When it heat-treats at $80-270$ degrees C, it cools radiationally further and it places on a surface plate, in each of four sides, it is desirable that the sum total of the height of four or less pieces and the relief section is set [the maximum height of the relief section] to 5mm or less by the number of 3mm or less and the relief sections. When heat-treatment of heat developing processing, burning processing, etc. is performed, the lithography version original edition of this mode does not have deformation by heating, and when it considers as the lithography version, distortion of Siwa etc. cannot generate it easily. Also in case conveyance nature is not spoiled and it attaches in the printing cylinder of a printing machine by this, the fault of poor fitness nature does not occur.

[0013] It is desirable that the Erichsen values after removing an image recording layer are $2-10$. Poor wearing is not caused, in case both ends are bent and it attaches in the printing cylinder of a printing machine by this. Furthermore, when punching processing of the punch hole by decision processing by the slitting machine, bundle decision processing by the guillotine cutter, and the die set etc., cutting processing by the cutter, etc. are processed, poor processing does not

generate the lithography version original edition of this mode.

[0014] Said aluminum base material has the concave pit on the front face especially, and it is more desirable that the diameter of average opening of this concave pit is 0.6 micrometers or less, and the averages of the ratio of the depth to the diameter of opening of this concave pit are 0.15 or more and 1.0 or less. In the lithography version original edition after performing cutting processing by the slitting machine, a cutter, etc., breakaway of an image recording layer may have arisen [near the edge section (amputation stump section)]. Moreover, even if breakaway of the image recording layer near the edge section has not arisen at the time of cutting, it may be generated during printing. If the aluminum base material used for the lithography version original edition of this invention has the concave pit on the front face and the above-mentioned range has the average of the ratio of the depth to the diameter of average opening and the diameter of opening of this concave pit, the adhesion of an image recording layer and a base material will become what was extremely excellent, and breakaway of the image recording layer near [which was mentioned above] the edge section will not arise. As for the diameter of average opening of a concave pit, it is more desirable that it is 0.3 micrometers or less, and it is desirable that it is 0.1 micrometers or more. As for the average of the ratio of the depth to the diameter of opening of a concave pit, it is more desirable that it is 0.2 or more, and it is more desirable that it is 0.5 or less.

[0015]

[Embodiment of the Invention] Hereafter, this invention is explained to a detail.

[Aluminum base material]

An aluminium alloy is used for the lithography version original edition of <aluminum plate (rolling aluminum)> this invention. Although especially an aluminium alloy is not limited, for 0.05 to 0.2 mass %, and Cu content, 0.006 to 0.4 mass % and Mg content is [Fe content / 0.2 to 1 mass %, and Si content / Ti content] below 0.04 mass %s below 0.03 mass %, and the aluminium alloy with which the remainder consists of aluminum and an unescapable impurity is used suitably, for example. Hereafter, this aluminium alloy is explained.

[0016] Fe is the element contained before and after 0.1 – 0.2 mass % also in a virgin metal, there are few amounts which dissolve in aluminum and most remains as an intermetallic compound. Although Fe has the operation which raises the mechanical strength of an aluminium alloy, if [than 1 mass %] more, it will become easy to generate a crack in the middle of rolling.

Moreover, if there are too many Fe contents, in case it will become the high intensity beyond the need and will attach in the printing cylinder of a printing machine as a lithography version, fitness nature is inferior and it lifting-comes to be easy of a version piece during printing. Moreover, it lifting-comes to be easy of a version piece, in case a mechanical strength will be too low and will attach the lithography version in the printing cylinder of a printing machine, if there are too few Fe contents. Moreover, it lifting-comes to be easy of a version piece, in case a voluminousness number is printed at high speed similarly. As an intermetallic compound, aluminum₃ Fe, aluminum₆ Fe, an AlFeSi system compound, an AlFeSiMn system compound, etc. are typical. In the above-mentioned aluminium alloy, Fe content is carried out to more than 0.2 mass %, and is made below into 1 mass %.

[0017] Si is the element contained before and after 0.03 – 0.1 mass % also in a virgin metal, and that also in Scrap aluminum is contained. [many] Si is in the condition which dissolved in aluminum, or exists as an intermetallic compound or an independent sludge. Moreover, when heated in the manufacture process of an aluminum base material, Si which was dissolving may deposit as a simple substance Si. According to this invention persons' knowledge, when a simple substance Si is superfluous, cruel-proof ink dirt nature falls. Here, "cruel ink dirt" means the dirt of the shape of the punctiform which appears in the printed paper, or a circular ring, as a result of ink's becoming easy to adhere to the non-image section surface part of the lithography version, when it carries out interrupting printing repeatedly. Moreover, Si content affects the electrochemical-surface-roughening nature of an aluminum plate. As an intermetallic compound, AlFeSi system compound, AlFeSiMn system compound, and Mg₂ Si etc. is typical. In the above-mentioned aluminium alloy, Si content is carried out to more than 0.05 mass %, and is made below into 0.2 mass %.

[0018] Cu is an element by which ultralow volume content is carried out into a virgin metal. Cu tends [comparatively] to dissolve in aluminum. Cu affects the electrochemical-surface-roughening nature of an aluminum plate greatly. In the above-mentioned aluminium alloy, Cu content is carried out to more than 0.006 mass %, and is made below into 0.4 mass %.

[0019] Moreover, the above-mentioned aluminium alloy can contain Mg and/or Ti as an arbitration component.

[0020] Mg is an element which ultralow volume content is carried out into a virgin metal, and are contained. By adding Mg, the heat-resistant softening degree and mechanical strength of an aluminum plate can be raised. Mg tends [comparatively] to dissolve in aluminum and forming Si and an intermetallic compound is also known. In the above-mentioned aluminium alloy, Mg is an arbitration component and Mg content is below 0.03 mass %. As for Mg content, it is desirable that it is more than 0.001 mass %.

[0021] Ti is usually an element carried out 0.01-0.04 mass % addition as crystal detailed-sized material. Ti is mainly an intermetallic compound with aluminum, or TiB₂. It is added by carrying out. When Ti contains superfluously, the electrochemical-surface-roughening nature of an aluminum plate may be affected. In the above-mentioned aluminium alloy, Ti is an arbitration component and Ti content is below 0.04 mass %. As for Ti content, it is desirable that it is more than 0.001 mass %.

[0022] The remainder of an aluminum plate consists of aluminum and an unescapable impurity. Most unescapable impurities are contained in aluminum metal. If an unescapable impurity is contained in the metal of 99.7% of aluminum purity, it will not spoil the effectiveness using the above-mentioned aluminium alloy mentioned later. About the unescapable impurity, the impurity of the amount indicated by L.F.Mondolfo work "Aluminum Alloys:Structure and properties" (1976) etc. may contain, for example. As an unescapable impurity contained in the above-mentioned aluminium alloy, Mn, Zn, Cr, and B are mentioned, for example.

[0023] Mn is an element by which ultralow volume content is carried out into a virgin metal. Mn tends [comparatively] to dissolve in aluminum and forms aluminum, Fe, Si, etc. and an intermetallic compound. Mn affects the electrochemical-surface-roughening nature of an aluminum plate while raising the mechanical strength of an aluminum plate.

[0024] Zn is an element by which ultralow volume content is carried out into a virgin metal. Zn tends [comparatively] to dissolve in aluminum. Zn affects the electrochemical-surface-roughening nature of an aluminum plate.

[0025] Ultralow volume content of the Cr may be carried out into a virgin metal.

[0026] B may be added with Ti as crystal detailed-sized material. B may be contained in the range below 0.04 mass %.

[0027] The effectiveness acquired when using the aluminium alloy which makes aluminum, Fe, Si, and Cu which were mentioned above an indispensable alloy content is explained below. A printing machine printing cylinder adds each of the part which the both ends were bent and was bent when the lithography version was attached in the printing cylinder of a printing machine, after applying tension so that a printing cylinder may be made to stick the lithography version to the section and two clamps which add and are called a bottom part, it is fixed, and printing is presented with it. If there is an inclination to become easy to lose touch with a printing cylinder, in two bent parts of the both ends of the lithography version for the reaction force over bending and a printing cylinder is repeatedly pushed against a blanket in the condition, since a relief part will be bent here repeatedly, there is fault that fatigue fracture (version piece) tends to take place. If it is made specific range which mentioned above the presentation of the aluminum plate used for the lithography version original edition to such fault, *****-proof will improve.

[0028] The following approach is employable in order to make an aluminium alloy into a plate. First, the aluminum molten metal containing a desired element is prepared. Subsequently, defecation processing of this aluminum molten metal is carried out, and unnecessary gas, such as hydrogen currently mixed into a molten metal, and a solid impurity are removed. As defecation processing which removes unnecessary gas, the degasifying processing using flux processing; argon gas, chlorine gas, etc. is mentioned, for example. Moreover, as defecation processing which removes a solid impurity, the filtering processing using the filter which makes filter media the so-

called rigid media filters, such as a ceramic-tube filter and a ceramic form filter, an alumina flake, alumina balls, etc., a grass cloth filter, etc. is mentioned, for example. Moreover, defecation processing which combined degasifying processing and filtering processing can also be performed.

[0029] As for these defecation processings, it is desirable to carry out in order to prevent the defect by foreign matters, such as nonmetallic inclusion in a molten metal, and an oxide, and the defect by the gas which melted into the molten metal. As filtering processing of a molten metal, the approach indicated by JP,6-57342,A, JP,3-162530,A, JP,5-140659,A, JP,4-231425,A, JP,4-276031,A, JP,5-311261,A, and JP,6-136466,A can be used, for example. Moreover, as degasifying processing of a molten metal, the approach indicated by JP,5-51659,A, JP,5-51660,A, JP,5-49148,A, and JP,7-40017,A can be used, for example.

[0030] Subsequently, either casting using the fixed mold represented by the direct chill casting process and casting using the drive mold represented by the continuous casting process cast an aluminium alloy molten metal. When using a direct chill casting process, it is solidified with the cooling rate of the range of 1-300 degrees C/second. Since many big and rough intermetallic compounds may be formed as a cooling rate is less than 1 degree C/second, it is not desirable. As a continuous casting process, the approach using the cooling roller represented by the congruence rolling method and the 3C method and the approach using the cooling belt or cooling block represented by the congruence belt method and the ARUSUISU axle-pin-rake II mold are performed industrially. When using a continuous casting process, it is solidified with the cooling rate of the range of 100-1000 degrees C/second. Generally, since the cooling rate is quick compared with a direct chill casting process, a continuous casting process has the description that whenever [dissolution / of the alloy content to an aluminum matrix] can be made high. About a continuous casting process, the approach indicated by JP,3-79798,A, JP,5-201166,A, JP,5-156414,A, JP,6-262203,A, JP,6-122949,A, JP,6-210406,A, and JP,6-262308,A can be used, for example.

[0031] since the ingot of 300-800mm of board thickness is manufactured in the case of a direct chill casting process -- a conventional method -- following -- facing -- a surface -- 1-10mm is cut preferably 1-30mm. Then, soak-ized processing is performed if needed. When performing soak-ized processing, heat treatment of 1 - 48 hours is performed at 450-620 degrees C so that an intermetallic compound may not make it big and rough. In the case of less than 1 hour, it may become inadequate [the effectiveness of soak-ized processing]. Soak-ized processing can be omitted when there is no need for stabilization of an intermetallic compound.

[0032] Then, hot rolling and cold rolling are performed and it considers as the rolled plate of an aluminium alloy plate. 350-500 degrees C is suitable for the initiation temperature of hot rolling. Intermediate-annealing processing may be carried out to the middle before cold rolling or the back. The condition is whether it heats at 350-500 degrees C preferably by 280-600 degrees C for 2 to 10 hours for 2 to 20 hours using a batch type annealing furnace, or to heat 2 or less minutes at 450-550 degrees C preferably 6 or less minutes by 400-600 degrees C using a continuous annealing furnace. It can heat with the programming rate of 10 degrees C/second or more using a continuous annealing furnace, and the crystalline structure can also be made fine. It is at the hot rolling termination time, and as long as the crystalline structure is detailed, intermediate annealing may omit. About cold rolling, the approach indicated by JP,6-210308,A can be used, for example.

[0033] Predetermined thickness, for example, the aluminum plate to which 0.1-0.5mm was made, may improve smoothness by orthodontic appliance, such as a roller leveler and a tension leveler, further. Moreover, in order to process it into the predetermined board width, letting a slitting machine line pass is also usually performed.

[0034] According to the approach using cooling rollers, such as the case of continuous casting, for example, the congruence rolling method etc., direct continuous casting rolling of the cast metal plate of 1-10mm of board thickness can be carried out, and there is an advantage that the process of hot rolling can be skipped. Moreover, according to the approach using cooling belts, such as the congruence belt method, the cast metal plate of 10-50mm of board thickness can be cast, and the continuous casting rolled plate of 1-10mm of board thickness is obtained by

using a hot rolling roll immediately after casting, and generally, rolling out continuously. As stated in DC casting, 0.1–0.7mm of predetermined thickness, for example, board thickness, is made to the continuous casting rolled plate obtained by these approaches through processes, such as cold rolling, intermediate annealing, a smoothness improvement, and a slit. About intermediate annealing at the time of using a continuous casting process, and the conditions of cold rolling, the approach indicated by JP,6-220593,A, JP,6-210308,A, JP,7-54111,A, and JP,8-92709,A can be used, for example.

[0035] As for the aluminum plate obtained as mentioned above, it is desirable that the width of face (only henceforth "width of face") of the direction where the crystal grain located in the field from the front face of an aluminum plate to a depth of 50 micrometers is perpendicular to a plate rolling direction is an average of 20 micrometers or more, and it is desirable that it is an average of 200 micrometers or less. By the approach of performing annealing by the continuous annealing furnace after hot rolling, and the method of performing annealing by the continuous annealing furnace, after cold-rolling once or more after hot rolling, as crystal grain was mentioned above, it can adjust. When magnitude of the crystal grain which exists in the predetermined depth field of an aluminum plate is made below into a predetermined value, much crystal grain will exist by per unit area. Since the metal texture of an aluminum plate consists of the grain boundary which are crystal grain and its boundary, the crystal grain and the grain boundary of many [say / that more crystal grain exists] mean existing. And if more crystal grain and the grain boundaries exist, propagation of the minute crack produced in repeat bending will stop being able to progress easily, and fatigue fracture of the lithography version which was a problem conventionally will stop being able to happen easily. Since it is easy to generate near the surface of a plate, especially a minute crack becomes important [the crystal grain located in the field from a front face to a depth of 50 micrometers]. Moreover, since it is hard to generate the poor appearance which originates that the width of face of the crystal grain located in the field from the front face of an aluminum plate to a depth of 50 micrometers is the above-mentioned range in a crystal orientation difference in surface down stream processing, especially alkali etching processing, the appearance of the lithography version original edition becomes desirable.

[0036] Although the approach by general macroetching can be used as a symptom of crystal grain, since the protective layer for aluminum elution control for example, at the time of development is applied also to the near field where a surface roughening process and image recording layer spreading are performed on the one side at least, and image recording layer spreading is not performed, the lithography version original edition of this invention may be unable to check crystal grain easily by simple macroetching. Therefore, observing is appropriate after making crystal grain easy to give abbreviation mirror plane finishing to a front face by mechanical polish or electrolytic machining, to once etch moreover using a predetermined etching reagent, and to observe. Here, the approach using abrasive paper as the approach of mechanical polish and the approach using an abrasive material and a puff are mentioned, for example. As the approach of electrolytic machining, the approach of carrying out direct-current electrolytic polishing in a sulfuric acid, a phosphoric acid, etc. is mentioned, for example. As an etching reagent for observing crystal grain, the water solution of a hydrofluoric acid, the water solution with which two or more acids were mixed can be used. Observation of crystal grain depends the sample which performed above polishes and etching on the approach of taking a photograph using the optical microscope using a polarizing filter. The width of face and die length of crystal grain can be measured using this photograph, and the average and maximum can be calculated.

[0037] moreover, the case where an aluminum plate is placed on a surface plate as a cut sheet of the rectangle whose lay length is 1.5m a plate pressure total -- plate pressure -- it is desirable that the side parallel to a direction a total is alike, respectively, set, and the sum total of the height of five or less pieces and the relief section is set [the maximum height of the relief section] to 4.0mm or less by the number of 2.0mm or less and the relief sections. In addition, when the angle of a cut sheet has come floating, this also comes floating and it includes in the number of the sections. Moreover, also in the inside of an aluminum plate, it is desirable that the sum total of the height of five or less pieces and the relief section is set [the maximum height

of the relief section] to 4.0mm or less by the number of 2.0mm or less and the relief sections. The height of the relief section of an aluminum plate and the concrete measuring method of a number are shown in drawing 1 . Drawing 1 is the side elevation seen from the direction perpendicular to the plate rolling direction which shows the measuring method of the relief section of the aluminum plate used suitable for this invention. Cut an aluminum plate 1 and it places on a surface plate 2 as a cut sheet of the rectangle whose lay length is 1.5m a plate pressure total. In the location which entered inside every 0.25m from each of the side perpendicular to the direction of a plate pressure total Main is carried out, 3 is placed, curl is held down, and after changing into the condition for which it covers more than full [of a cut sheet] that two sides and the relief section 4 inside an aluminum plate parallel to a plate rolling direction can be correctly measured about inside die length of 1m, the height and number of the relief sections 4 are measured. If the range mentioned above has the sum total of the maximum height of the relief section of an aluminum plate, a number, and height, the sum total of the maximum height of the relief section of the lithography version original edition of this invention, a number, and height will tend to serve as predetermined range.

[0038] Moreover, as for an aluminum plate, it is desirable that cross-section configurations are as follows. The sum total of the maximum height of the relief section of an aluminum plate, a number, and height tends to become that the cross-section configurations of an aluminum plate are as follows with the above-mentioned range, as a result the sum total of the maximum height of the relief section of the lithography version original edition of this invention, a number, and height tends to serve as predetermined range. Usually, predetermined period storage of the aluminum plate is carried out in the condition of having been wound as a coil. In a plate cross section, if the thickness of the edge of a plate, i.e., a handle part, is too thick, while being wound around a coiled form and kept over thousands of m, distortion of the edge where a thick part is called a lifting and lug distortion in plastic deformation occurs. Similarly, if the thickness inside a plate is too thick, distortion of the inside called a lifting and antinode distortion will generate plastic deformation.

[0039] Since the inclination which is hard to generate compared with lug distortion has generating of antinode distortion, in this invention, it is desirable to give priority to generating prevention of lug distortion, and to finish the board thickness inside a plate a little more thickly than the edge of a plate. In order to make below fixed board thickness of a handle part to the average board thickness of a plate, specifically, it is desirable to make or less into 1.0 a value defined as follows. Moreover, in order not to thicken board thickness inside a plate too much to average board thickness, it is desirable to make pc value defined as follows 2.0% or less. In the cold rolling process mentioned above, a value and pc value can be adjusted to a desired value by adjusting the deflection configuration of a cold rolling roll.

$$a=h/cpc= c/tcx100 (\%)$$

h: The difference tc of the difference c:center-section maximum board thickness of handle part board thickness and the minimum board thickness, and the minimum board thickness : the sectional view seen from the direction the plate pressure total which shows the cross-section configuration of the aluminum plate used suitable for center-section maximum board thickness this invention is shown in drawing 2 .

[0040] Although the aluminum base material used for this invention performs a surface roughening process to the above-mentioned aluminum plate and is obtained, various kinds of processes other than a surface roughening process may be included in the production process of this aluminum base material. Hereafter, various kinds of surface treatment performed to an aluminum plate is explained.

[0041] Graining processing of the <surface roughening process (graining processing)> above-mentioned aluminum plate is carried out at a desirable configuration. A graining art has mechanical graining which is indicated by JP,56-28893,A, chemical etching, an electrolysis grain, etc. Furthermore, the mechanical graining methods (mechanical surface roughening process), such as the electrochemical graining method (electrochemical-surface-roughening processing, electrolysis surface roughening process) for graining electrochemically in the hydrochloric-acid electrolytic solution or the nitric-acid electrolytic solution, and the wire brush grain method for

scratching an aluminum front face with a metal wire, the ball grain method for graining an aluminum front face by the polish ball and the abrasive material, the brush grain method for graining a front face by the nylon brush and the abrasive material, can be used. These graining methods are independent, or can be combined and used. For example, the combination of the mechanical surface roughening process by the nylon brush and the abrasive material and the electrolysis surface roughening process by the hydrochloric-acid electrolytic solution or the nitric-acid electrolytic solution and the combination of two or more electrolysis surface roughening processes are mentioned.

[0042] In the case of the brush grain method, the average depth of the crevice for long wave Naganari (large wave) of an aluminum support surface is controllable by choosing suitably conditions, such as a mean diameter of the particle used as an abrasive material, a maximum grain size, a hair diameter of the brush to be used, a consistency, and a pushing pressure. As for the crevice obtained by the brush grain method, it is desirable that average wavelength is 2-30 micrometers, and it is desirable that the average depth is 0.3-1 micrometer.

[0043] The electrochemical process which grains chemically in the hydrochloric-acid electrolytic solution or the nitric-acid electrolytic solution as the electrochemical-surface-roughening approach is desirable. desirable current density -- the time of an anode plate -- quantity of electricity 50 - 400 C/dm² it is . Furthermore, specifically, it is the temperature of 20-100 degrees C, 1 second - time amount 30 minutes, and current density 100-400C/dm² in the electrolytic solution containing the hydrochloric acid or nitric acid of 0.1 - 50 mass %. It is carried out using a direct current or an alternating current on conditions. Since it is easy to give detailed irregularity to a front face according to the electrolysis surface roughening process, adhesion of an image recording layer and a base material can be made high.

[0044] The pit of the shape of the shape of a crater with an average diameter [of about 0.05-2.0 micrometers] and an average depth of 0.01-0.4 micrometers and a honeycomb is generable at 90 - 100% of rate of area on the surface of an aluminum plate with the electrolysis surface roughening process after a mechanical surface roughening process. The prepared pit has the operation which improves the dirt hard and print durability of the non-image section of the printing version. In an electrolysis surface roughening process, the product of only quantity of electricity which is required in order to establish sufficient pit in a front face, i.e., the time amount which passed the current and the current, serves as important conditions. It is desirable also from a viewpoint of energy saving that pit sufficient with smaller quantity of electricity can be formed. The surface roughness after a surface roughening process is JIS. It is desirable that the arithmetic mean granularity (Ra) measured based on B0601-1994 by the cut-off value of 0.8mm and evaluation die length of 3.0mm is 0.2-0.6 micrometers.

[0045] In this invention, although it is desirable that a surface roughening process including an electrolysis surface roughening process is performed as for an aluminum plate, it may perform only an electrolysis surface roughening process and may perform it combining an electrolysis surface roughening process, and a mechanical surface roughening process or a chemical surface roughening process. Especially it is more desirable to combine an electrolysis surface roughening process and a mechanical surface roughening process, and it is desirable that an electrolysis surface roughening process is especially performed after a mechanical surface roughening process. Although a nitric acid and a hydrochloric acid can be used for an electrolysis surface roughening process as the electrolytic solution, it is especially desirable when not combining an electrolysis surface roughening process with a mechanical surface roughening process, and using a hydrochloric acid prepares the irregularity of the big letter of external waviness. Moreover, it is also desirable to perform the electrolysis surface roughening process which used the nitric acid after the mechanical surface roughening process, and to perform the electrolysis surface roughening process using a hydrochloric acid further. By adjusting the conditions of each surface roughening process in such a surface roughening process, the aluminum base material whose averages of the ratio of the depth to the diameter of opening of a concave pit the diameter of average opening of a surface concave pit is 0.6 micrometers or less, and are 0.15-1.0 can be obtained.

[0046] <Alkali etching processing> After the aluminum plate by which graining processing was

carried out in this way rinses after a surface roughening process for raising the dirt-proof nature at the time of printing etc., being chemically etched with alkali is desirable. Although especially the alkali chemicals suitably used in this invention are not limited, caustic soda, sodium carbonate, sodium aluminate, meta-sodium silicate, a sodium phosphate, a potassium hydroxide, and a lithium hydroxide are mentioned, for example. For the conditions of alkali etching processing, when it is desirable to carry out on conditions from which the amount of dissolutions of aluminum serves as 0.05 – 5.0 g/m² and it carries out after an electrolysis surface roughening process especially, the amount of dissolutions of aluminum is 0.5g/m². It is desirable to carry out on conditions which become the following. Moreover, although other conditions are not limited especially, as for the concentration of alkali, it is desirable that it is one to 50 mass %, it is more desirable that it is five to 30 mass %, and as for the temperature of alkali, it is desirable that it is 20–100 degrees C, and it is more desirable [temperature] that it is 30–50 degrees C. Alkali etching processing can combine one sort of not only approaches but two or more processes.

[0047] Alkali etching processing is not restricted to one step of processings. For example, it can combine performing alkali etching processing again and performing a desmut treatment succeedingly, after performing alkali etching processing, performing succeedingly a desmut treatment (pickling for desmutting mentioned later), after performing a mechanical surface roughening process, and performing an electrolysis surface roughening process further etc. two or more times, and it can perform each of alkali etching processings and desmut treatments.

[0048] While controlling the path of the pit which constitutes medium wave structure by this alkali etching in the to some extent desirable range, the small wave structure which consists of detailed irregularity can be formed in the interior of a pit. Detailed irregularity is an indeterminate form and the projected area diameter (area projected area diameter) is 0.01–0.2 micrometers.

[0049] After performing alkali etching processing, in order to remove the dirt (smut) which remains on a front face, it is desirable that pickling (desmut treatment) is performed. As an acid used, a nitric acid, a sulfuric acid, a phosphoric acid, a chromic acid, fluoric acid, and fluoroboric acid are mentioned, for example. The method of making the sulfuric acid of 15 – 65 mass % with a temperature of 50–90 degrees C which is preferably indicated by JP,53-12739,A especially as a desmutting art after an electrolysis surface roughening process contact is mentioned.

[0050] <Anodizing> To the aluminum plate processed as mentioned above, in order to raise the abrasion resistance of the front face of an aluminum plate, it is still more desirable that anodizing is performed. Under the present circumstances, since the micro pore which exists in an anodic oxide film may produce a sensibility fall if its path of micro pore is too large while it is effective in raising adhesion with an image recording layer, the micro pore of moderate magnitude is required for it. Anodizing can be performed by the approach currently conventionally performed in this field.

[0051] As long as the electrolyte used for anodizing can form a porosity oxide film, what kind of thing is sufficient as it. Generally, a sulfuric acid, a phosphoric acid, oxalic acid, chromic acids, or such mixture are used. A sulfuric acid can be used as a principal component and, specifically, an anodic oxide film can be formed on the surface of an aluminum plate if needed by passing a direct current or an alternating current to an aluminum plate in combined water solutions, such as a phosphoric acid, a chromic acid, oxalic acid, sulfamic acid, and benzenesulfonic acid.

[0052] Under the present circumstances, the component usually contained in aluminum alloy plate, an electrode, tap water, an underground water, etc. at least may be contained in the electrolytic solution. Furthermore, the 2nd and 3rd component may be added. As the 2nd and 3rd component here, for example Na, K, Mg, Li, Cations of metals, such as calcium, Ti, aluminum, V, Cr, Mn, Fe, Co, nickel, Cu, and Zn, such as ion; ammonium ion; Nitrate ion, Anions, such as carbonate ion, chloride ion, phosphoric-acid ion, fluoride ion, sulfite ion, titanate-acid ion, silicate ion, and boric-acid ion, may be mentioned, and it may be contained by the concentration which is about 0–10000 ppm.

[0053] Since it changes with the electrolytic solutions used variously, the conditions of anodizing must generally have been determined. For example, electrolytic concentration is suitably decided according to an electrolytic class etc. It is suitable that it is generally one to electrolytic-solution concentration 15 mass %, 5–70 degrees-C [of solution temperature], current density 1

- 60 A/dm², electrical-potential-differences 1-200V, and electrolysis time amount 10 - 300 seconds.

[0054] this invention -- setting -- the amount of an anodic oxide film -- 1 - 5 g/m² it is -- a thing is desirable. 1 g/m² A blemish becomes it easy to go into a version to be the following, and, on the other hand, it is 5 g/m². If it exceeds, great power will be needed for manufacture and it will become disadvantageous economically. the amount of an anodic oxide film -- 1.5 - 4 g/m² it is -- a thing is more desirable.

[0055] <Hydrophilization processing> Hydrophilization processing may be performed for the aluminum base material with which the anodic oxide film which processes as mentioned above and is obtained was formed if needed. As hydrophilization processing, a well-known approach, for example, alkali-metal silicate processing, can be used conventionally. Alkali-metal silicate processing is performed by carrying out the dipping of the aluminum base material to the water solution of an alkali-metal silicate. Although not limited, for example using the water solution of concentration 0.01 - 5.0 mass %, especially processing conditions are 5-40 degrees C in temperature, the dipping of them is carried out for 1 - 60 seconds, and a stream washes them after that. More desirable dipping processing temperature is 10-40 degrees C, and more desirable dipping time amount is for 2 - 20 seconds.

[0056] As for the alkali-metal silicate used for this invention, a sodium silicate, a potassium silicate, and a silicic-acid lithium are mentioned. The water solution of an alkali-metal silicate may carry out suitable amount content of a sodium hydroxide, a potassium hydroxide, the lithium hydroxide, etc. Moreover, the water solution of an alkali-metal silicate may contain an alkaline-earth-metal salt or 4 group (the IVA group) metal salt. As an alkaline earth metal salt, nitrate; sulfate; hydrochloride; phosphate; acetate; oxalate; borates, such as a calcium nitrate, a strontium nitrate, a magnesium nitrate, and a barium nitrate, are mentioned, for example. As a 4 group (the IVA group) metal salt, a titanium tetrachloride, a titanium trichloride, a titanium fluoride potassium, a titanium oxalate potassium, sulfuric-acid titanium, 4 titanium iodide, a chlorination zirconium dioxide, a zirconium dioxide, zirconium oxychloride, and a zirconium tetrachloride are mentioned, for example. These alkaline-earth-metal salts and 4 group (the IVA group) metal salt are independent, or are combined two or more sorts and used.

[0057] the amount of Si to which it sticks by alkali-metal silicate processing is measured with X-ray fluorescence equipment -- having -- the amount of adsorption -- about 1.0 to 15.0 mg/m² it is -- a thing is desirable. By this alkali-metal silicate processing, the dissolution-proof disposition top effectiveness over the alkali developer of an aluminum support surface is acquired, the elution to the inside of the developer of an aluminum component is controlled, and generating of the development dregs resulting from fatigue of a developer can be reduced.

[0058] What is necessary is to apply a sensitization agent to a front face, to dry it, and just to make image recording layers illustrated below, such as a sensitization layer and a sensible-heat layer, form, in order to use the base material for the [lithography version original edition] lithography versions as the lithography version original edition.

[0059] In addition, in this invention, after making image recording layers, such as a sensitization layer, form, it is desirable to correct curl (curliness) of a plate and to consider as the lithography version original edition. As an approach of correcting curl, the tension which is extent which a crack does not generate is added to an image recording layer, for example, and the approach using the curl stripper of making it **** to a straightener roll in a roller leveler etc. is mentioned. If curl of a plate is corrected, since residual stress will be released, the sum total of the maximum height of the relief section of the lithography version original edition of this invention, a number, and height tends to serve as predetermined range.

[0060] Especially a sensitization agent is not limited and can use what is usually used for the photosensitive lithography version original edition. And a lith film is used for the obtained lithography version original edition, an image can be burned, and it can consider as the lithography version which can be attached in a printing machine by performing a development and gum length processing further. Moreover, if a high sensitivity sensitization layer is prepared for example, an image can also be directly burned using laser.

[0061] If the solubility or bloating tendency over a developer changes before and after exposure

as a sensitization agent, neither will interfere. A typical thing is listed.

[0062] (A) As a sensitization layer positive type photosensitivity compound which consists of an o-quinone diazide compound, o-quinone diazide compound represented with o-naphthoquinonediazide compound is mentioned. As an o-naphthoquinonediazide compound, the ester of the 1 and 2-diazo naphthoquinone sulfonic-acid chloride indicated by JP,43-28403,B and pyrogallol-acetone resin is desirable. The ester of the 1 and 2-diazo naphthoquinone sulfonic-acid chloride indicated by the U.S. Pat. No. 3,046,120 specification and the U.S. Pat. No. 3,188,210 specification and phenol-formaldehyde resin is also desirable. In addition, well-known o-naphthoquinonediazide compound is also usable.

[0063] Especially desirable o-naphthoquinonediazide compound is a compound with which molecular weight was obtained at the reaction of 1,000 or less polyhydroxy compound and 1 and 2-diazo naphthoquinone sulfonic-acid chloride. It is desirable to be 0.2-1.2Eq in rate, and to make 1 and 2-diazo naphthoquinone sulfonic-acid chloride react at a rate of 0.3-1.0Eq especially to 1Eq of hydroxyls of a polyhydroxy compound. As 1 and 2-diazo naphthoquinone sulfonic-acid chloride, although 1 and 2-diazo naphthoquinone-5-sulfonic-acid chloride is desirable, 1 and 2-diazo naphthoquinone-4-sulfonic-acid chloride is also usable.

[0064] Although it differs variously and becomes mixture, it is desirable that the rate (although esterified completely content) that the thing which is the location and the amount of installation of a substituent of 1 and 2-diazo naphthoquinone sulfonic-acid chloride and by which all hydroxyls were converted into the 1 and 2-diazo naphthoquinone sulfonate occupies into mixture is more than 5 mol %, as for o-naphthoquinonediazide compound, it is more desirable that it is [20-90 mol] %, and it is desirable that it is [20-99 mol] especially %.

[0065] Moreover, the polymer which has o-nitro carbinol ester group indicated by JP,56-2696,B is also usable as a photosensitive compound which acts on a positive type, without using o-naphthoquinonediazide compound. Furthermore, the combination system of the compound which generates an acid by the photolysis, and the compound which has the -C-O-C-radical or -C-O-Si-radical dissociated with an acid is also usable. For example, the combination of the compound which generates an acid by the photolysis, and an acetal or O and N-acetal compound (JP,48-89003,A), Ortho ester or combination with an amide acetal compound (JP,51-120714,A), Combination with the polymer which has an acetal or a ketal radical in a principal chain (JP,53-133429,A), Combination with an enol ether compound (JP,55-12995,A), Combination with N-acyl imino carbon compound (JP,55-126236,A), Combination with the polymer which has an ortho ester radical in a principal chain (JP,56-17345,A), Combination (JP,60-10247,A) with a silyl ester compound, combination (JP,60-37549,A, JP,60-121446,A) with a silyl ether compound, etc. are mentioned.

[0066] As for the rate of the positive type photosensitivity compound (the above combination systems are also included) occupied in the photosensitive constituent of a sensitization layer, it is desirable that it is ten to 50 mass %, and it is more desirable that it is 15 to 40 mass %.

[0067] Although a sensitization layer can be constituted even if o-quinone diazide compound is independent, it is desirable to use it for the alkaline water as a binder (binder) with meltable resin. As meltable resin, to the alkaline water, novolak resin, phenol-formaldehyde resin, m-cresol formaldehyde resin, p-cresol-formaldehyde resins, m-/p-mixing cresol formaldehyde resin, a phenol / cresol mixing (m-) p- and m-/p-mixing someday Cresol formaldehyde resin, such as - formaldehyde resins, Phenol denaturation xylene resin, polyhydroxy styrene, Pori halogenation hydroxystyrene, The acrylic resin containing phenol nature hydroxyl which is indicated by JP,51-34711,A, the acrylic resin which has the sulfonamide radical indicated by JP,2-866,A, urethane system resin, etc. are mentioned. Weight average molecular weight is 500-20,000, and the thing of 200-60,000 has [resin meltable to the alkaline water] desirable number average molecular weight.

[0068] Resin meltable to the alkaline water is contained so that it may become below 70 mass % of all photosensitive constituents. Furthermore, when raising the admiration oily skin of an image, it is desirable to use together the resin obtained by the polycondensation of the phenol and formaldehyde which have the alkyl group of carbon numbers 3-8 like t-butylphenol-formaldehyde resins and octyl phenol-formaldehyde resins as substituents, as indicated by the U.S. Pat. No.

4,123,279 specification.

[0069] A photosensitive constituent can be made to contain the color as the printing-out agent for obtaining a visible image immediately after a cyclic anhydride and exposure, and an image coloring agent, other fillers, etc. in order to raise sensibility. Phthalic anhydride, tetrahydro phthalic anhydride, hexahydro phthalic anhydride, 3, and 6- and oxy--**4-tetrahydro phthalic anhydride, tetra-KURORU phthalic anhydride, a maleic anhydride, the Krol maleic anhydride, alpha-phenyl maleic anhydride, a succinic anhydride, pyromellitic dianhydride, etc. are used as the cyclic anhydride is indicated by the U.S. Pat. No. 4,115,128 specification. A cyclic anhydride can raise sensibility to a maximum of 3 about times by doing 1-15 mass % content of to the mass of all photosensitive constituents. As a printing-out agent for obtaining a visible image immediately after exposure, the combination of the photosensitive compound which emits an acid by exposure, and the organic dye which can form a salt can be mentioned as a representative.

[0070] The combination of the trihalomethyl compound and salt plasticity organic dye which are specifically indicated by the combination of o-naphthoquinonediazide-4-sulfonic-acid halo GENIDO indicated by JP,50-36209,A and JP,53-8128,A and salt plasticity organic dye, JP,53-36233,A and JP,54-74728,A, JP,60-3626,A, JP,61-143748,A, JP,61-151644,A, and JP,63-58440,A can be mentioned. As a coloring agent of an image, other colors other than the aforementioned salt plasticity organic dye are usable. Suitable colors including salt plasticity organic dye are an oil color and a base color.

[0071] Specifically, oil yellow #101, oil yellow #103, oil pink #312, the oil green BG, oil blue BOS, oil blue #603, oil black BY, oil black BS, oil black T-505 (all the above is the ORIENT chemical-industry company make), Victoria pure blue, a crystal violet (CI42555), Methyl Violet (CI42535), rhodamine B (CI45170B), Malachite Green (CI42000), a methylene blue (CI52015), etc. can be mentioned. Especially the color indicated by JP,62-293247,A is desirable.

[0072] It is made to dissolve in the solvent which dissolves said many components, and a photosensitive constituent is applied to the base material for the lithography versions. As a solvent, ethylene dichloride, a cyclohexanone, a methyl ethyl ketone, Ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, 2-methoxy ethyl acetate, 1-methoxy-2-propanol, 1-methoxy-2-propyl acetate, toluene, methyl acetate, ethyl acetate, Methyl lactate, ethyl lactate, dimethyl sulfoxide, dimethylacetamide, Dimethylformamide, water, N-methyl pyrrolidone, tetrahydrofurfuryl alcohol, an acetone, diacetone alcohol, a methanol, ethanol, isopropanol, a diethylene glycol, wood ether, etc. are mentioned. These can also be mixed and used.

[0073] Said component (solid content) occupied in a solution is two to 50 mass %. Generally coverage is 0.5 - 3.0 g/m² as solid content, although it changes with applications. It is desirable. Although photosensitivity increases as coverage decreases, the physical properties of a film fall.

[0074] A photosensitive constituent is made to contain a surfactant, for example, a fluorochemical surfactant which is indicated by JP,62-170950,A, in order to improve spreading nature. As for the content of a surfactant, it is desirable that it is 0.01 to 1 mass [of all photosensitive constituents] %, and it is more desirable that it is 0.05 to 0.5 mass %.

[0075] (B) The condensation product (the so-called photosensitive diazo resin) of the diphenylamine-p-diazonium salt and formaldehyde which are the resultant of the diazonium salt currently indicated by the U.S. Pat. No. 2,063,631 specification and the U.S. Pat. No. 2,667,415 specification and the organic condensing agent which has a reactant carbonyl group like an aldol or an acetal as a sensitization layer negative operation mold photosensitivity diazo compound which consists of diazo resin and a binder is used suitably.

[0076] Other useful condensation diazo compounds are indicated by JP,49-480001,B, JP,49-45322,B, JP,49-45323,B, etc. Since it is obtained in the form of water-soluble mineral salt, this type of photosensitive diazo compound can usually be applied as a water solution. Moreover, it can be made to be able to react by the approach indicated by JP,47-1167,B in the water-soluble diazo compound with the aromatic series or the aliphatic compound which has one piece or the phenol nature hydroxyl beyond it, a sulfonic group, or its both, and the photosensitive diazo resin of water-insoluble nature can also be used for the real target which is the product.

[0077] The content of diazo resin is good in a sensitization layer to do 5-50 mass % content of.

Although photosensitivity will naturally increase if the content decreases, stability with the passage of time falls. The content of the optimal diazo resin is about eight to 20 mass %. The polymer which, on the other hand, has functional groups, such as hydroxyl, the amino group, a carboxyl group, an amide group, a sulfonamide radical, an activity methylene group, a thioalcohol radical, and an epoxy group, although various polymers are usable as a binder is desirable.

[0078] The shellac specifically indicated by such polymer at the British patent No. 1,350,521 specification, The polymer which includes a hydroxyethyl (meta) acrylate unit which is indicated by the British patent No. 1,460,978 specification and the U.S. Pat. No. 4,123,276 specification as a main loop unit, The polyamide resin indicated by the U.S. Pat. No. 3,751,257 specification, The phenol resin indicated by the British patent No. 1,074,392 specification, And for example, polyvinyl-formal resin, polyvinyl-acetal resin like polyvinyl butyral resin, the line indicated by the U.S. Pat. No. 3,660,097 specification -- polyurethane resin -- The phthalate-ized resin of polyvinyl alcohol, the epoxy resin obtained from bisphenol A and epichlorohydrin, Cellulosics, such as a polymer which has poly amino styrene and an amino group like poly alkylamino (meta) acrylate, cellulose acetate, cellulose alkyl ether, and cellulose acetate phthalate, are included.

[0079] The constituent which consists of diazo resin and a binder can be made to contain further additives, such as a pH indicator which is indicated by the British patent No. 1,041,463 specification, a phosphoric acid indicated by the U.S. Pat. No. 3,236,646 specification, and a color.

[0080] As for the thickness of a sensitization layer, it is desirable that it is 0.1-30 micrometers, and it is more desirable that it is 0.5-10 micrometers. the amount (solid content) of the sensitization layer prepared on the base material for the lithography versions -- usually -- about 0.1 - about 7 g/m² -- desirable -- 0.5 - 4 g/m² it is .

[0081] Thus, processing which includes development with a conventional method is performed, a resin image is formed by this, and the obtained lithography version original edition turns into the lithography version, after image exposure is carried out. For example, in the case of the positive type photosensitivity lithography version original edition which has a sensitization layer (A), by developing negatives in an alkali water solution which is indicated by a U.S. Pat. No. 4,259,434 specification and JP,3-90388,A, the sensitization layer of an exposure part is removed and the lithography version is obtained after image exposure.

[0082] Moreover, by developing negatives with a developer which is indicated by after image exposure (for example, a U.S. Pat. No. 4,186,006 specification) in the case of the negative-mold photosensitivity lithography version original edition which has the sensitization layer (B) which consists of diazo resin and a binder, the sensitization layer of an unexposed part is removed and the lithography version is obtained. Moreover, the lithography version is obtained by in the case of the negative-mold photosensitivity lithography version original edition indicated by JP,5-2273,A or JP,4-219759,A, developing negatives in the water solution of an alkali-metal silicate as indicated by this official report.

[0083] Moreover, as an image recording layer, the following image recording layer A-E is also used suitably.

[0084] The <image recording layer A> image recording layer A is a thermal positive image recording layer. For example, the following image recording layers A-1 to A-3 are mentioned.

[0085] The lithography version original edition which has the <image recording layer A-1> image recording layer A-1 comes to prepare the sensitization layer which carries out alkali solubilization with an alkali soluble interlayer and heating on the aluminum base material obtained as mentioned above one by one. Hereafter, the sensitization layer which carries out alkali solubilization with an alkali soluble interlayer and heating is explained.

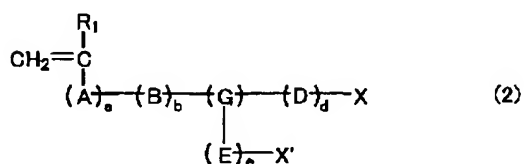
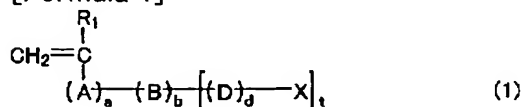
[0086] As for the alkali soluble interlayer in the lithography version original edition of <interlayer> this invention, it is desirable to contain the polymer which has the monomer which has an acid radical, although it will not be limited especially if it is an alkali soluble layer, and it is more desirable to contain the polymer which has the monomer which has the monomer which has an acid radical, and an onium radical. Hereafter, the polymer contained in an interlayer is explained in detail. The polymer contained in an interlayer is a compound which comes to carry out the polymerization of the monomer which has an acid radical at least, and is a compound which

comes to carry out the polymerization of the monomer which has preferably the monomer which has an acid radical, and an onium radical. Here, as an acid radical, seven or less acid radical is desirable, and are $-\text{COOH}$, $-\text{SO}_3\text{H}$, $-\text{OSO}_3\text{H}$, $-\text{PO three H}_2$, $-\text{OPO three H}_2$, $-\text{CONHSO}_2$, and $-\text{SO}_2\text{NHSO}_2-$ more preferably, and an acid dissociation exponent (electric dissociation exponent) is $-\text{COOH}$ especially preferably. Moreover, a thing desirable as an onium radical is an onium radical containing the atom of periodic table 15 group (the VB group) or 16 groups (the IVB group), is an onium radical which contains a nitrogen atom, the Lynn atom, or a sulfur atom more preferably, and is an onium radical which contains a nitrogen atom preferably especially.

[0087] It is the polymer compound characterized by the polymer used for this invention being a desirable vinyl system polymer [like acrylic resin, methacrylic resin, or polystyrene] whose principal chain structure is, urethane resin, polyester, or a polyamide. It is the polymer compound more preferably characterized by the principal chain structure of this polymer being a vinyl system polymer like acrylic resin, methacrylic resin, or polystyrene. Especially preferably, it is the compound by which the monomer which has an acid radical is expressed with a following general formula (1) or a following general formula (2), and the monomer which has an onium radical is the polymer compound characterized by being the compound expressed with a general formula (3), an after-mentioned general formula (4), or an after-mentioned general formula (5).

[0088]

[Formula 1]

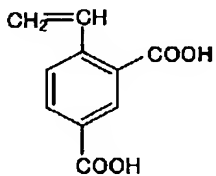
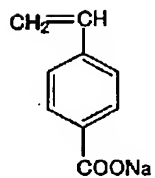
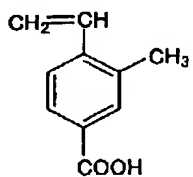
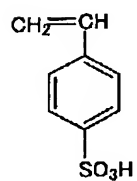
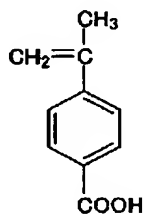
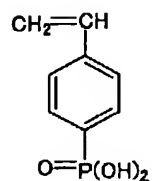
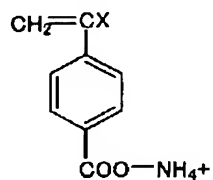
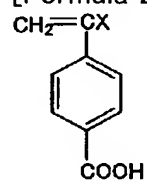


[0089] A expresses a divalent connection radical among a formula. B expresses an aromatic series radical or a permutation aromatic series radical. D and E express a divalent connection radical independently, respectively. G expresses a trivalent connection radical. As for X and X', electric dissociation exponent expresses independently seven or less acid radical, its alkali-metal salt, or ammonium salt, respectively. R1 A hydrogen atom, an alkyl group, or a halogen atom is expressed. a, b, d, and e express 0 or 1 independently, respectively. t is the integer of 1-3. More preferably in the monomer which has an acid radical, A expresses $-\text{COO}-$ or $-\text{CONH}-$, B expresses a phenylene group or a permutation phenylene group, and the substituent is a hydroxyl group, a halogen atom, or an alkyl group. D and E express independently the divalent connection radical as which an alkylene group or a molecular formula is expressed in $\text{C}_n\text{H}_{2n}\text{O}$, $\text{C}_n\text{H}_{2n}\text{S}$, or $\text{C}_n\text{H}_{2n+1}\text{N}$, respectively. G expresses the trivalent connection radical as which a molecular formula is expressed in $\text{C}_n\text{H}_{2n-1}$ and $\text{C}_n\text{H}_{2n-1}\text{O}$, $\text{C}_n\text{H}_{2n-1}\text{S}$, or $\text{C}_n\text{H}_{2n}\text{N}$. However, n expresses the integer of 1-12 here. X and X' expresses independently a carboxylic acid, a sulfonic acid, phosphonic acid, a sulfuric monoester, or phosphoric-acid monoester, respectively. R1 A hydrogen atom or an alkyl group is expressed. Although a, b, d, and e express 0 or 1 independently, respectively, a and b are not 0 at coincidence. It is the compound especially shown by the general formula (1) preferably in the monomer which has an acid radical, and B expresses a phenylene group or a permutation phenylene group, and the substituent is a hydroxyl group or an alkyl group of carbon numbers 1-3. D and E express the alkylene group of the carbon numbers 1-2 connected independently by the alkylene group or oxygen atom of carbon numbers 1-2, respectively. R1 A hydrogen atom or an alkyl group is expressed. X expresses a carboxylic-acid radical. a is 0 and b is 1.

[0090] The example of the monomer which has an acid radical is shown below. However, this invention is not limited to this example.

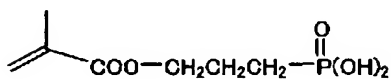
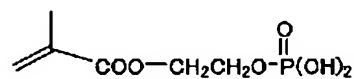
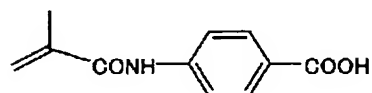
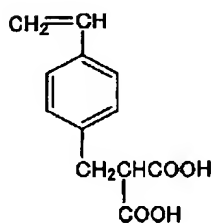
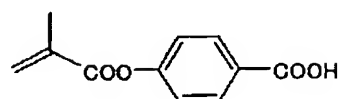
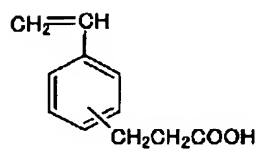
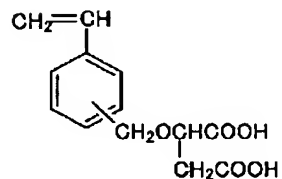
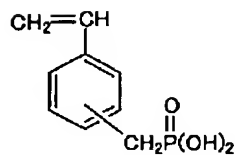
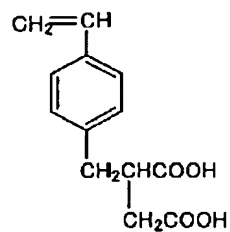
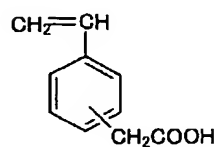
(Example of the monomer which has an acid radical) An acrylic acid, a methacrylic acid, a crotonic acid, isocrotonic acid, an itaconic acid, a maleic acid, a maleic anhydride [0091]

[Formula 2]



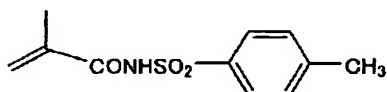
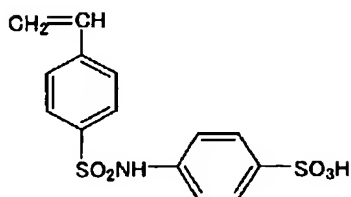
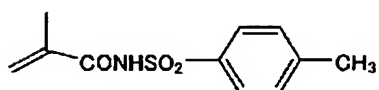
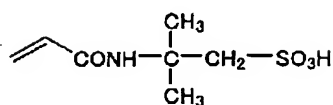
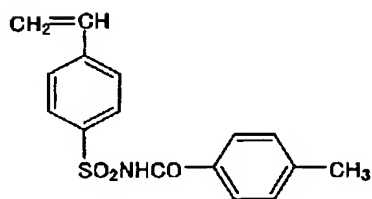
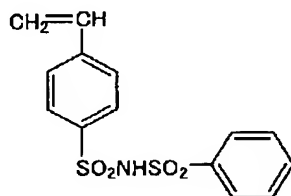
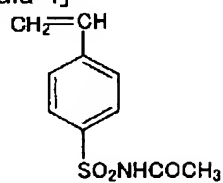
[0092]

[Formula 3]



[0093]

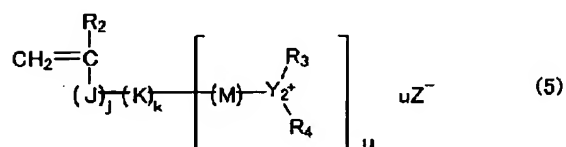
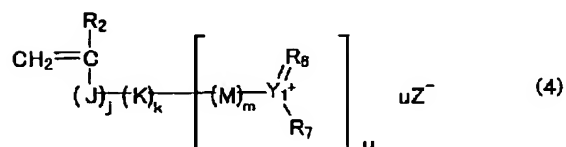
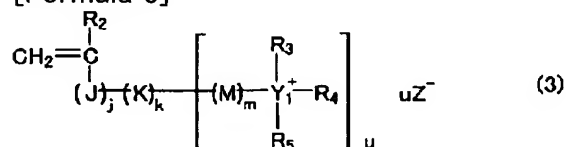
[Formula 4]



[0094] The polymer expressed with the following general formula (3) which is the monomer which has an onium radical, (4), or (5) below is explained.

[0095]

[Formula 5]



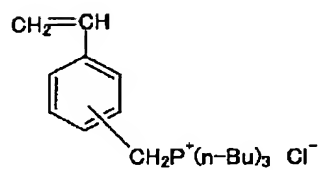
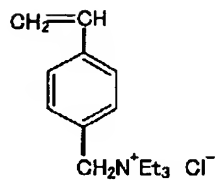
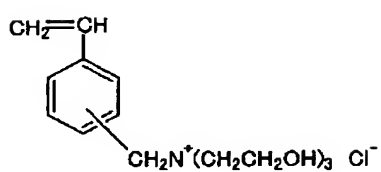
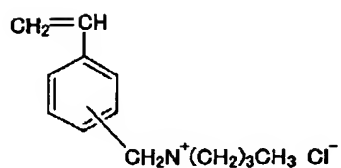
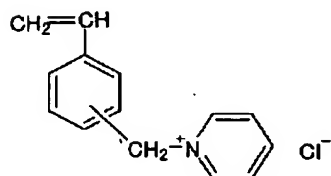
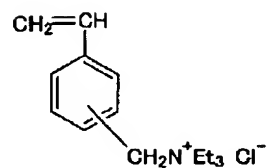
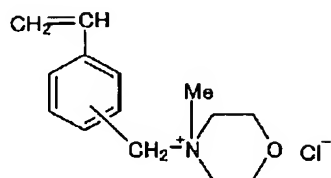
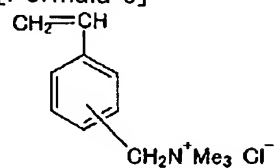
[0096] J expresses a divalent connection radical among a formula. K expresses an aromatic series radical or a permutation aromatic series radical. M expresses a divalent connection radical independently, respectively. Y1 Periodic table 15 group's (the VB group) atom is expressed, and it is Y2. Periodic table 16 group's (the VIB group) atom is expressed. Z- Express a **** anion. R2 A hydrogen atom, an alkyl group, or a halogen atom is expressed. R3, R4, and R5 And R7 A hydrogen atom or the alkyl group which a substituent may combine depending on the case, an aromatic series radical, or an aralkyl radical is expressed independently, respectively, and it is R6. It is R3 although an ARUKI lysine radical or a permutation ARUKI lysine is expressed. R4 Or R6 R7 It may join together, respectively and a ring may be formed. j, k, and m express 0 or 1 independently, respectively. u expresses the integer of 1-3. More preferably in the monomer which has an onium radical, J expresses -COO- or -CONH-, K expresses a phenylene group or a permutation phenylene group, and the substituent is a hydroxyl group, a halogen atom, or an alkyl group. M expresses the divalent connection radical as which an alkylene group or a molecular formula is expressed in Cn H2nO, Cn H2nS, or Cn H2n+1N. However, n expresses the integer of 1-12 here. Y1 A nitrogen atom or the Lynn atom is expressed and it is Y2. A sulfur atom is expressed. Z- ** halogen ion and PF6- and BF4 - Or R8 SO3 - It expresses. R2 A hydrogen atom or an alkyl group is expressed. R3, R4, and R5 And R7 The alkyl group, aromatic series radical, or aralkyl radical of a hydrogen atom or the carbon numbers 1-10 which a substituent may combine depending on the case is expressed independently, respectively, and it is R6. Although the ARUKI lysine radical or permutation ARUKI lysine of carbon numbers 1-10 is expressed R3 R4 and R6 R7 It may join together, respectively and a ring may be formed. Although j, k, and m express 0 or 1 independently, respectively, j and k are not 0 at coincidence. R8 The alkyl group, aromatic series radical, or aralkyl radical of the carbon numbers 1-10 which a substituent may combine is expressed. Especially preferably in the monomer which has an onium radical, K expresses a phenylene group or a permutation phenylene group, and the substituent is a hydrogen atom or an alkyl group of carbon numbers 1-3. M expresses the alkylene group of the carbon numbers 1-2 connected by the alkylene group or oxygen atom of carbon numbers 1-2. Z- ***** or R8 SO3 - It expresses. R2 expresses a hydrogen atom or a methyl group. j is 0 and k is 1. R8 The alkyl group of carbon numbers 1-3 is expressed.

[0097] The example of the monomer which has an onium radical is shown below. However, this invention is not limited to this example.

(Example of the monomer which has an onium radical)

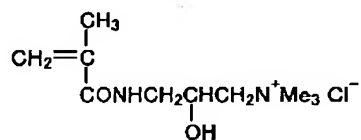
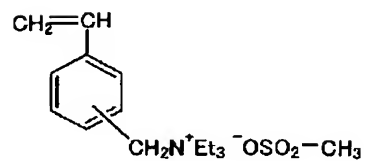
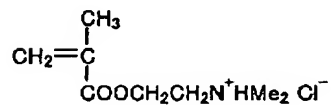
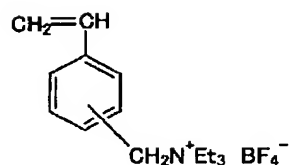
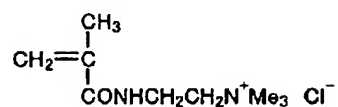
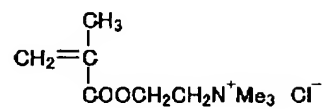
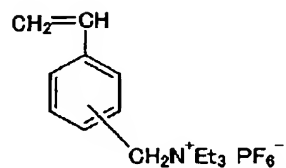
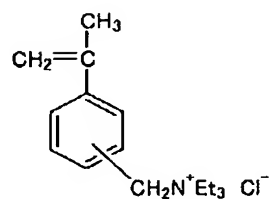
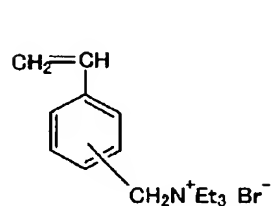
[0098]

[Formula 6]



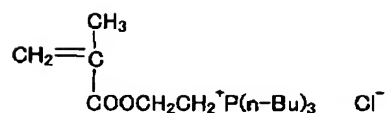
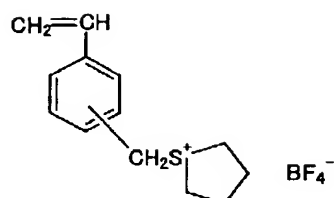
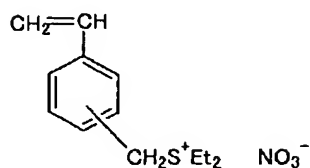
[0099]

[Formula 7]



[0100]

[Formula 8]



[0101] The monomer which may use independently the monomer which has an acid radical, or may combine two or more sorts, and may use it, and has an onium radical may be used independently, or two or more sorts may be combined and it may be used. Furthermore, two or more sorts may be mixed and that from which a monomer, a presentation ratio, or molecular weight differs may be used for the polymer used for this invention. under the present circumstances, the monomer in which the polymer which has the monomer which has an acid radical as a polymerization component has an acid radical -- more than 1 mol % -- containing -- desirable -- more than 5 mol % -- the monomer in which the polymer which has the monomer in which containing is more desirable and it has an onium radical as a polymerization component has an onium radical -- more than 1 mol % -- containing -- desirable -- more than 5 mol % -- containing is more desirable.

[0102] Furthermore, these polymers may contain at least one sort chosen from the polymerization nature monomer shown in the following (1) - (14) as a copolymerization component.

(1) N-(4-hydroxyphenyl) acrylamide or N-(4-hydroxyphenyl) methacrylamide, o-, m- or p-hydroxystyrene, o-, or m-BUROMO-p-hydroxystyrene, The acrylamides which have aromatic series hydroxyl groups, such as o- or m-Krol-p-hydroxystyrene, o-, m-, or p-hydroxyphenyl acrylate or methacrylate Methacrylamide, acrylic ester, methacrylic ester, and BIDOROKISHI styrene (2) Unsaturated carboxylic acid, such as an acrylic acid, a methacrylic acid, a maleic acid, a maleic anhydride and its half ester, an itaconic acid, itaconic acid anhydride, and its half ester, [0103] (3) N-(o-amino sulfonyl phenyl) acrylamide, N-(m-amino sulfonyl phenyl) acrylamide, N-(p-amino sulfonyl phenyl) acrylamide, N-[1-(3-amino sulfonyl) naphthyl] acrylamide, Acrylamides, such as N-(2-amino sulfonyl ethyl) acrylamide N-(o-amino sulfonyl phenyl) methacrylamide, N-(m-amino sulfonyl phenyl) methacrylamide, N-(p-amino sulfonyl phenyl) methacrylamide, N-[1-(3-amino sulfonyl) naphthyl] methacrylamide, Methacrylamide, such as N-(2-amino sulfonyl ethyl) methacrylamide Moreover, o-aminosulfonylphenylacrylate, m-

aminosulfonylphenylacrylate, Partial saturation sulfonamides, such as acrylic ester, such as p-aminosulfonylphenylacrylate and 1-(3-amino sulfonyl phenyl naphthyl) acrylate, O-aminosulfonylphenylmethacrylate, m-aminosulfonylphenylmethacrylate, Partial saturation sulfonamides, such as methacrylic ester, such as p-aminosulfonylphenylmethacrylate and 1-(3-amino sulfonyl phenyl naphthyl) methacrylate, [0104] (4) The phenyl sulfonyl acrylamide which may have a substituent like tosyl acrylamide, And the phenyl sulfonyl methacrylamide which may have a substituent like tosyl methacrylamide, (5) The acrylic ester and methacrylic ester which have an aliphatic series hydroxyl group, For example, 2-hydroxyethyl acrylate or 2-hydroxyethyl methacrylate, (6) A methyl acrylate, an ethyl acrylate, acrylic-acid propyl, Butyl acrylate, acrylic-acid amyl, acrylic-acid hexyl, acrylic-acid cyclohexyl, Acrylic-acid octyl, acrylic-acid phenyl, acrylic-acid benzyl, acrylic-acid-2-chloro ethyl, Acrylic ester, such as acrylic-acid 4-hydroxy butyl, glycidyl acrylate, and N-dimethylamino ethyl acrylate (permutation), (7) A methyl methacrylate, ethyl methacrylate, methacrylic-acid propyl, Methacrylic-acid butyl, methacrylic-acid amyl, methacrylic-acid hexyl, Cyclohexyl methacrylate, methacrylic-acid octyl, methacrylic-acid phenyl, Methacrylic ester (permutation), such as methacrylic-acid benzyl, methacrylic-acid-2-chloro ethyl, methacrylic-acid 4-hydroxy butyl, glycidyl methacrylate, and N-dimethylaminoethyl methacrylate, [0105] (8) Acrylamide, methacrylamide, N-methylol acrylamide, N-methylol methacrylamide, N-ethyl acrylamide, N-ethyl methacrylamide, N-hexyl acrylamide, N-hexyl methacrylamide, N-cyclohexyl acrylamide, N-cyclohexyl methacrylamide, N-hydroxyethyl acrylamide, N-hydroxyethyl methacrylamide, N-phenyl acrylamide, N-phenyl methacrylamide, N-benzyl acrylamide, N-benzyl methacrylamide, N-nitrophenyl acrylamide, N-nitrophenyl methacrylamide, N-ethyl-N-phenyl acrylamide and acrylamides, such as N-ethyl-N-phenyl methacrylamide, or methacrylamide, (9) Vinyl ether, such as ethyl vinyl ether, 2-chloro ethyl vinyl ether, hydroxyethyl vinyl ether, propyl vinyl ether, butyl vinyl ether, octyl vinyl ether, and phenyl vinyl ether, [0106] (10) Vinyl acetate, vinyl chloro acetate, vinyl butyrate, Vinyl ester, such as benzoic-acid vinyl, (11) styrene, alpha methyl styrene, Styrene, such as methyl styrene and chloro methyl styrene, (12) methyl vinyl ketones, Vinyl ketones, such as an ethyl vinyl ketone, a propyl vinyl ketone, and a phenyl vinyl ketone (13) Olefins, such as ethylene, a propylene, an isobutylene, a butadiene, and an isoprene, (14) N-vinyl pyrrolidone, N-vinylcarbazole, 4-vinylpyridine, acrylonitrile, methacrylonitrile, etc.

[0107] in addition, the monomer which has an acid radical in the polymer used here -- more than 1 mol % -- containing -- desirable -- more than 5 mol % -- the monomer in which containing is more desirable and it has an onium radical -- more than 1 mol % -- containing -- desirable -- more than 5 mol % -- containing is more desirable. furthermore, the monomer which has an acid radical -- more than 20 mol % -- the monomer which the dissolution removal at the time of alkali development is promoted further, and has an onium radical when contained -- more than 1 mol % -- if contained, adhesion will improve further according to the synergistic effect with an acid radical. Moreover, the monomer which may use independently the constituent which has an acid radical, or may combine two or more sorts, and may use it, and has an onium radical may be used independently, or two or more sorts may be combined and it may be used. Furthermore, two or more sorts may be mixed and that from which a monomer, a presentation ratio, or molecular weight differs may be used for the polymer used for this invention. The typical example of the polymer used for this invention is shown below. In addition, the presentation ratio of polymer structure expresses mole percentage.

[0108]

[Formula 9]

構造	代表的な高分子化合物の具体例	数平均分子量 (Mn)
No.1		2,100
No.2		4,800
No.3		3,200
No.4		2,300
No.5		1,400

[0109]

[Formula 10]

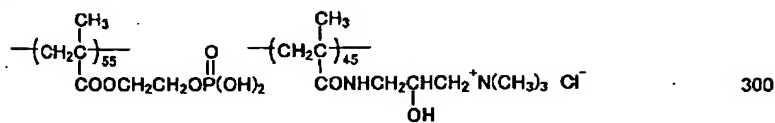
No.	構造	数平均分子量 (Mn)
No.6		4,500
No.7		5,000
No.8		1,000
No.9		1,300
No.10		2,900
No.11		800

[0110]

[Formula 11]

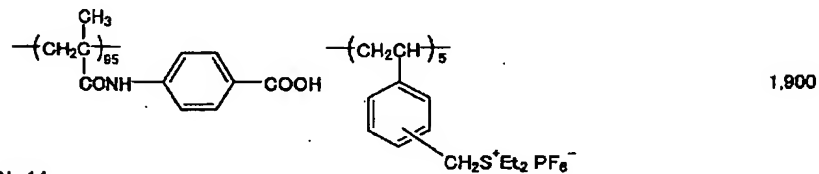
構造 数平均分子量 (Mn)

No.12



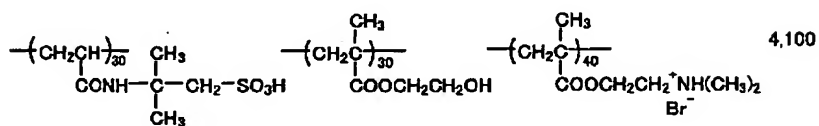
300

No.13



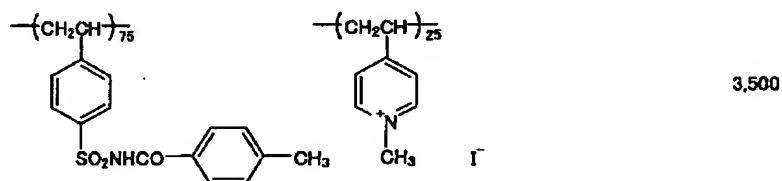
1,900

No.14



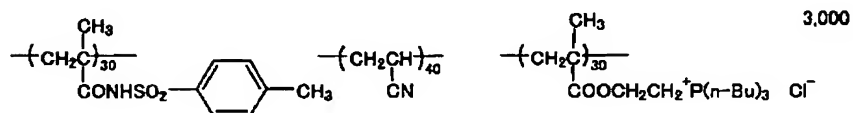
4,100

No.15



3,500

No.16



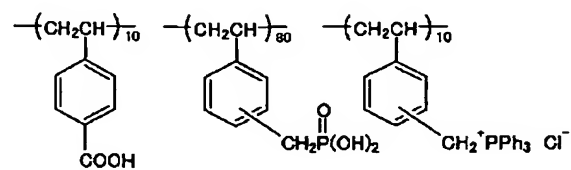
3,000

[0111]

[Formula 12]

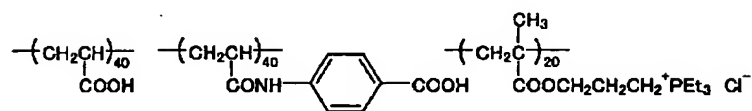
構造 数平均分子量 (Mn)

No.17



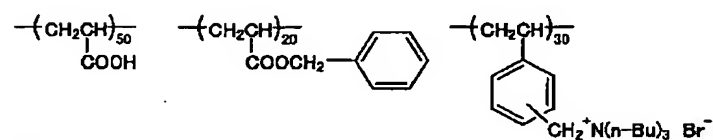
3,300

No.18



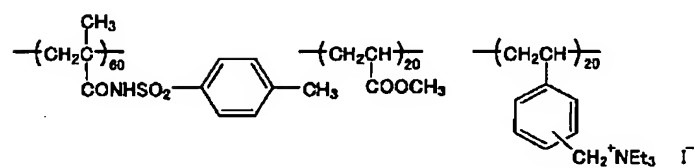
600

No.19



5,000

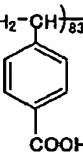
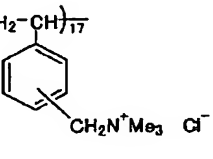
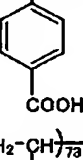
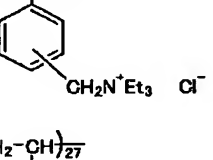
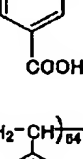
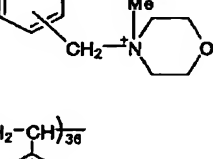
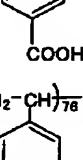
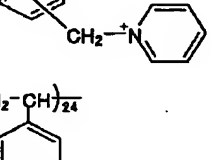
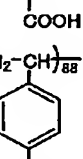
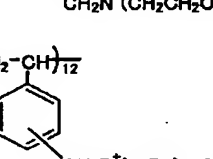
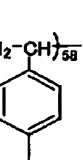
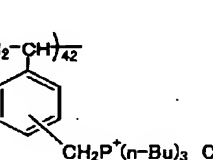
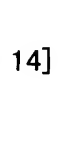

No.20



2,400

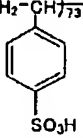
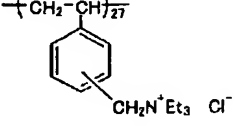
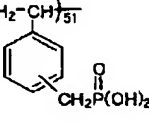
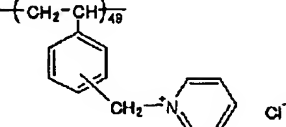
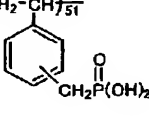
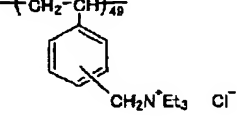
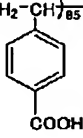
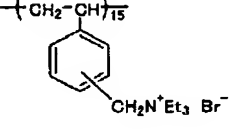
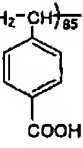
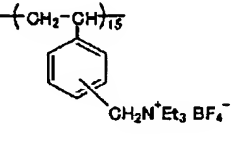
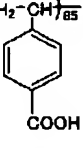
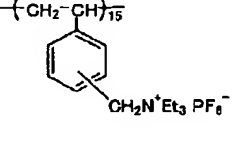
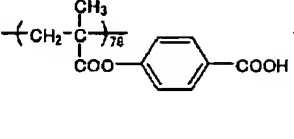
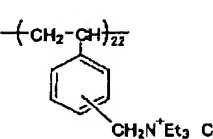
[0112]

[Formula 13]

構造	代表的な高分子化合物の例	分子量(Mw)
No.21 $\text{-(CH}_2\text{-CH)}_{83}$ 	$\text{-(CH}_2\text{-CH)}_{17}$ 	3.2万
No.22 $\text{-(CH}_2\text{-CH)}_{85}$ 	$\text{-(CH}_2\text{-CH)}_{15}$ 	2.8万
No.23 $\text{-(CH}_2\text{-CH)}_{73}$ 	$\text{-(CH}_2\text{-CH)}_{27}$ 	2.6万
No.24 $\text{-(CH}_2\text{-CH)}_{64}$ 	$\text{-(CH}_2\text{-CH)}_{36}$ 	4.1万
No.25 $\text{-(CH}_2\text{-CH)}_{78}$ 	$\text{-(CH}_2\text{-CH)}_{24}$ 	1.1万
No.26 $\text{-(CH}_2\text{-CH)}_{88}$ 	$\text{-(CH}_2\text{-CH)}_{12}$ 	1.7万
No.27 $\text{-(CH}_2\text{-CH)}_{58}$ 	$\text{-(CH}_2\text{-CH)}_{42}$ 	3.6万

[0113]

[Formula 14]

構造	分子量(Mw)
No.28 $\left(\text{CH}_2 - \text{CH} \right)_{73}$ 	2.2万
$\left(\text{CH}_2 - \text{CH} \right)_{27}$ 	
No.29 $\left(\text{CH}_2 - \text{CH} \right)_{51}$ 	4.4万
$\left(\text{CH}_2 - \text{CH} \right)_{49}$ 	
No.30 $\left(\text{CH}_2 - \text{CH} \right)_{51}$ 	1.9万
$\left(\text{CH}_2 - \text{CH} \right)_{49}$ 	
No.31 $\left(\text{CH}_2 - \text{CH} \right)_{85}$ 	2.8万
$\left(\text{CH}_2 - \text{CH} \right)_{15}$ 	
No.32 $\left(\text{CH}_2 - \text{CH} \right)_{85}$ 	2.8万
$\left(\text{CH}_2 - \text{CH} \right)_{13}$ 	
No.33 $\left(\text{CH}_2 - \text{CH} \right)_{85}$ 	2.8万
$\left(\text{CH}_2 - \text{CH} \right)_{15}$ 	
No.34 $\left(\text{CH}_2 - \text{C} \right)_{78}$ 	3.4万
$\left(\text{CH}_2 - \text{CH} \right)_{22}$ 	

[0114]

[Formula 15]

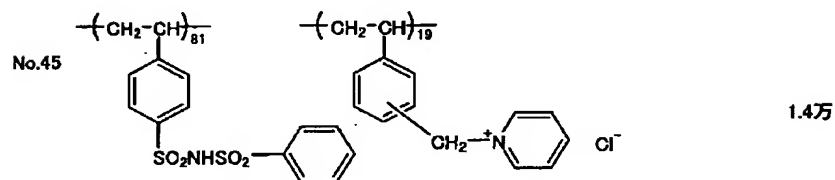
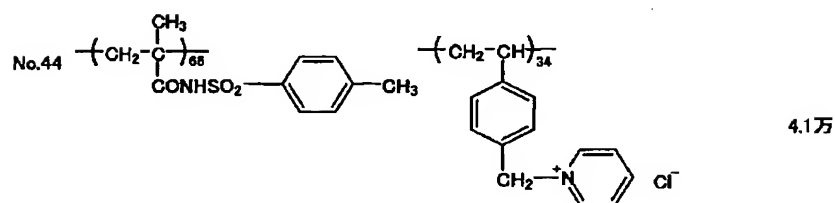
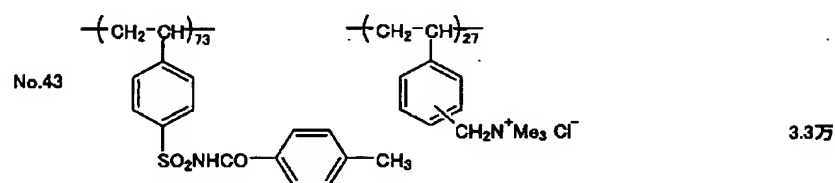
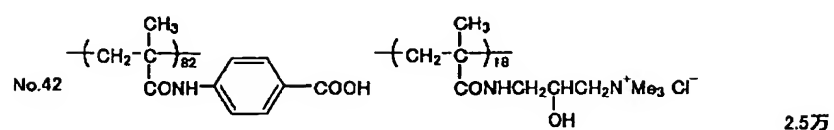
構造	代表的な高分子化合物の例	分子量(Mw)
No.35	$\left(\text{CH}_2 - \underset{\text{CONH} - \text{C}_6\text{H}_4 - \text{COOH}}{\overset{\text{CH}_3}{\text{C}}} \right)_{74} \quad \left(\text{CH}_2 - \underset{\text{CH}_2\text{N}^+\text{Et}_3 \text{ Cl}^-}{\overset{\text{CH}}{\text{C}}} \right)_{28}$	4.2万
No.36	$\left(\text{CH}_2 - \underset{\text{COO} - \text{C}_6\text{H}_4 - \text{COOH}}{\overset{\text{CH}_3}{\text{C}}} \right)_{68} \quad \left(\text{CH}_2 - \underset{\text{COOCH}_2\text{CH}_2\text{N}^+\text{Me}_3 \text{ Cl}^-}{\overset{\text{CH}_3}{\text{C}}} \right)_{34}$	1.3万
No.37	$\left(\text{CH}_2 - \underset{\text{CH}_2\text{P}(\text{OH})_2}{\overset{\text{CH}}{\text{C}}} \right)_{48} \quad \left(\text{CH}_2 - \underset{\text{COOCH}_2\text{CH}_2\text{N}^+\text{Me}_3 \text{ Cl}^-}{\overset{\text{CH}_3}{\text{C}}} \right)_{52}$	1.5万
No.38	$\left(\text{CH}_2 - \underset{\text{COOCH}_2\text{CH}_2\text{OP}(\text{OH})_2}{\overset{\text{CH}_3}{\text{C}}} \right)_{84} \quad \left(\text{CH}_2 - \underset{\text{CONHCH}_2\text{CH}_2\text{N}^+\text{Me}_3 \text{ Cl}^-}{\overset{\text{CH}_3}{\text{C}}} \right)_{38}$	4.8万
No.39	$\left(\text{CH}_2 - \underset{\text{COO} - \text{C}_6\text{H}_4 - \text{COOH}}{\overset{\text{CH}_3}{\text{C}}} \right)_{72} \quad \left(\text{CH}_2 - \underset{\text{COOCH}_2\text{CH}_2\text{N}^+\text{HMe}_2 \text{ Cl}^-}{\overset{\text{CH}_3}{\text{C}}} \right)_{28}$	3.4万
No.40	$\left(\text{CH}_2 - \underset{\text{COOH}}{\overset{\text{CH}_3}{\text{C}}} \right)_{83} \quad \left(\text{CH}_2 - \underset{\text{CH}_2\text{N}^+\text{Et}_3 \text{ Cl}^-}{\overset{\text{CH}}{\text{C}}} \right)_{37}$	6.3万
No.41	$\left(\text{CH}_2 - \underset{\text{C}_6\text{H}_4 - \text{COOH}}{\overset{\text{CH}}{\text{C}}} \right)_{72} \quad \left(\text{CH}_2 - \underset{\text{CONHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{N}^+\text{Me}_3 \text{ Cl}^-}{\overset{\text{CH}_3}{\text{C}}} \right)_{28}$	2.5万

[0115]

[Formula 16]

構造

分子量(Mw)

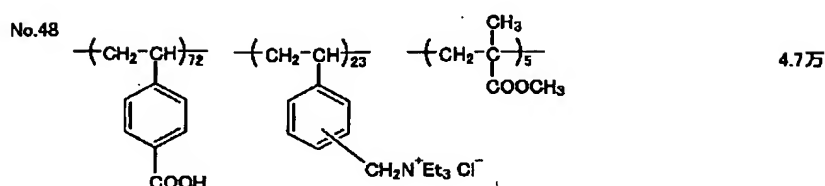
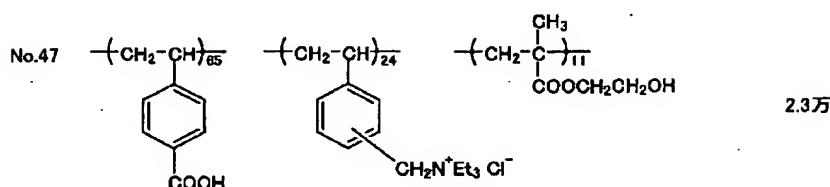
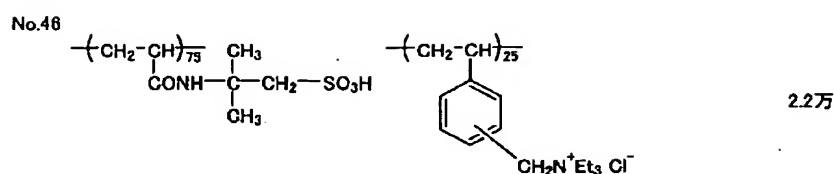


[0116]

[Formula 17]

構造

分子量(Mw)



[0117] Generally the polymer used for this invention can be manufactured using a radical chain polymerization method (refer to "Textbook of Polymer Science" 3rd ed.(1984) F.W.Billmeyer and A Wiley-Interscience Publication).

[0118] Although the molecular weight of the polymer used for this invention may be wide range, when it measures using light scattering measurement, it is desirable that weight average molecular weight (Mw) is 500-2,000,000, and it is more desirable that it is the range of 1,000-600,000. Moreover, it is desirable that the number average molecular weight (Mn) computed from the integrated intensity of the end group and side-chain functional group in NMR measurement is 300-500,000, and it is more desirable that it is the range of 500-100,000. If molecular weight is smaller than the above-mentioned range, the adhesion force with a substrate may become weak and degradation of print durability may arise. On the other hand, when molecular weight becomes large across the above-mentioned range, the adhesion force to a base material becomes strong too much, and there is a case where it becomes impossible to fully remove the sensible-heat layer residue of the non-image section. Moreover, although the amount of unreacted monomers contained in this polymer may be wide range, it is desirable that it is below 20 mass %, and it is more desirable that it is below 10 mass %.

[0119] In case the polymer which has the molecular weight of the above-mentioned range copolymerizes a corresponding monomer, it can use together a polymerization initiator and a chain transfer agent, and can obtain them from adjusting an addition. In addition, a chain transfer agent means the matter to which the active spot of a reaction is moved by chain transfer reaction in a polymerization reaction, and the ease of happening of the migration reaction is expressed with a chain transfer constant Cs. It is desirable that it is 0.01 or more, as for chain transfer constant Csx104 (60 degrees C) of the chain transfer agent used by this invention, it is more desirable that it is 0.1 or more, and it is desirable that it is especially one or more. As a polymerization initiator, the peroxide generally well used in the case of a radical polymerization, an azo compound, and a redox initiator can be used as it is. Especially an azo compound is desirable in these.

[0120] As an example of a chain transfer agent, halogenated compounds, such as a carbon

tetrachloride and carbon tetrabromide, Alcohols, such as isopropyl alcohol and isobutyl alcohol, Olefins, such as 2-methyl-1-butene, 2, and 4-diphenyl-4-methyl-1-pentene Ethanethiol, a butane thiol, a dodecane thiol, mercaptoethanol, Mercapto propanol, mercaptopropionic acid methyl, mercaptopropionic acid ethyl, Mercaptopropionic acid, thioglycolic acid, ethyl disulfide, Although ** sulfur compounds, such as sec-butyl disulfide, 2-hydroxyethyl disulfide, thio salicylic acid, a thiophenol, thio cresol, benzyl mercaptan, and a phenethyl mercaptan, are mentioned, it is not limited to these. More preferably Ethanethiol, a butane thiol, a dodecane thiol, Mercaptoethanol, mercapto propanol, mercaptopropionic acid methyl, Mercaptopropionic acid ethyl, mercaptopropionic acid, thioglycolic acid, Ethyl disulfide, sec-butyl disulfide, 2-hydroxyethyl disulfide, They are thio salicylic acid, a thiophenol, thio cresol, benzyl mercaptan, and a phenethyl mercaptan. Preferably especially Ethanethiol, a butane thiol, a dodecane thiol, mercaptoethanol, They are mercapto propanol, mercaptopropionic acid methyl, mercaptopropionic acid ethyl, mercaptopropionic acid, thioglycolic acid, ethyl disulfide, sec-butyl disulfide, and 2-hydroxyethyl disulfide.

[0121] Moreover, although the amount of unreacted monomers contained in this polymer may be wide range, it is desirable that it is below 20 mass %, and it is still more desirable that it is below 10 mass %.

[0122] Below, the synthetic example of the polymer used for this invention is shown.

[Synthetic example 1] Having taken 50.4g [of synthetic p-vinyl benzoic acids] (Hokko Chemical Industry Co., Ltd. make), and triethyl (p-vinylbenzyl) ammonium chloride 15.2g, mercaptoethanol 1.9g, and methanol 153.1g of a polymer (No.1) to the three-neck flask of 2L **, and agitating under a nitrogen air current, it heated and kept at 60 degrees C. 2 and 2'-azobis (isobutyric acid) dimethyl 2.8g was added to this solution, and stirring was continued for 30 minutes as it was. Then, 201.5g [of p-vinyl benzoic acids] and triethyl (p-vinylbenzyl) ammonium chloride 60.9g, mercaptoethanols 7.5g and 2, and the solution made to dissolve 2'-azobis (isobutyric acid) dimethyl 11.1g in methanol 612.3g were dropped at this reaction mixture over 2 hours. Temperature was raised to 65 degrees C after dropping termination, and stirring was continued for bottom 10 hours of a nitrogen air current. After reaction termination, when cooled radiationally to the room temperature, the yield of this reaction mixture was 1132g, and that solid content concentration was 30.5 mass %. Furthermore, the value was 2100 as a result of calculating the number average molecular weight (Mn) of the obtained product from 13 C-NMR spectrum.

[0123] [Synthetic example 2] Except having used the m/p object (2/1) mixture of triethyl (vinylbenzyl) ammonium chloride, and having used mercaptopropionic acid ethyl instead of mercaptoethanol instead of the synthetic triethyl (p-vinylbenzyl) ammonium chloride of a polymer (No.2), the same actuation as the synthetic example 1 was performed, and the polymer of number average molecular weight (Mn) 4,800 was obtained.

[0124] [Synthetic example 3] Having taken 146.9g [of synthetic p-vinyl benzoic acids] (Hokko Chemical Industry Co., Ltd. make) (0.99 mols), and vinylbenzyl-trimethylammonium-chloride 44.2g (0.21 mols), and 2-methoxyethanol 446g of a polymer (No.25) to the three-neck flask of 1L **, and agitating under a nitrogen air current, it heated and kept at 75 degrees C. Next, 2 and 2'-azobis (isobutyric acid) dimethyl 2.76g (12mmol) was added, and stirring was continued. 2 and 2'-azobis (isobutyric acid) dimethyl 2.76g (12mmol) was added 2 hours after. Furthermore, 2 and 2'-azobis (isobutyric acid) dimethyl 2.76g (12mmol) was added 2 hours after. After agitating for 2 hours, it cooled radiationally to the room temperature. This reaction mixture was poured out the bottom of stirring, and into the ethyl acetate of 12L. The solid-state which deposits was **** (ed) and it dried. The yield was 189.5g. As a result of the obtained solid-state performing the determination of molecular weight with light scattering measurement, weight average molecular weight (Mw) was 32,000.

[0125] Other polymers used for this invention are compounded by the same approach.

[0126] Moreover, the compound which is shown to the interlayer of the lithography version original edition of this invention by the following general formula (6) in addition to said polymer can also be added.

[0127]

[Formula 18]



[0128] (R1 expresses the arylene radical of carbon numbers 6-14 among a formula, and m and n express the integer of 1-3 independently.)

The compound shown by the above-mentioned general formula (6) is explained below. R1 As for the carbon number of the arylene radical expressed, it is desirable that it is 6-14, and it is more desirable that it is 6-10. R1 A phenylene group, a naphthyl group, an anthryl radical, and a FENA thrill radical are specifically as an arylene radical expressed mentioned. R1 The arylene radical expressed may be permuted by the alkyl group of carbon numbers 1-10, the alkenyl radical of carbon numbers 2-10, the alkynyl group of carbon numbers 2-10, the aryl group of carbon numbers 6-10, a carboxylate radical, an alkoxy group, a phenoxy group, a sulfonate radical, a phosphonate radical, a sulfonyl amide group, a nitro group, a nitrile group, the amino group, a hydroxy group, the halogen atom, the ethyleneoxide radical, the propylene oxide radical, the triethyl ammoniumchloride radical, etc.

[0129] As a concrete example of the compound shown by the general formula (6), 3-hydroxybenzoic acid, 4-hydroxybenzoic acid, a salicylic acid, a 1-hydroxy-2-naphthoic acid, a 2-hydroxy-1-naphthoic acid, a 2-hydronalium SHIKI 3-naphthoic acid, 2, 4-dihydroxybenzoic acid, and a 10-hydroxy-9-anthracene carboxylic acid are mentioned, for example. However, it is not limited to the above-mentioned example. Moreover, you may use independently, and two or more sorts may be mixed and the compound shown by the general formula (6) may be used.

[0130] On the aluminum base material mentioned above, the interlayer containing the compound indicated to be the above-mentioned polymer used for this invention by the above-mentioned general formula (6) added if needed applies by various approaches, and is prepared.

[0131] As an approach of preparing this interlayer, for example A methanol, ethanol, Apply the solution in which the compound shown in organic solvents, such as a methyl ethyl ketone, those partially aromatic solvents, or the partially aromatic solvent of these organic solvents and water by the general formula (6) added if needed [of being used for this invention / the polymer and if needed] was dissolved on an aluminum base material, and it dries. To organic solvents, such as the method of application to prepare, a methanol, ethanol, and a methyl ethyl ketone, those partially aromatic solvents, or the partially aromatic solvent of these organic solvents and water After carrying out the dipping of the aluminum base material to the solution in which the compound shown by the general formula (6) added if needed [of being used for this invention / the polymer and if needed] was dissolved, the approach of washing, and drying and establishing with rinsing or air, can be mentioned.

[0132] By the former approach, the solution of the concentration of 0.005 - 10 mass % can be applied by various approaches by the sum total of the above-mentioned compound. For example, which approaches, such as bar coating-machine spreading, rotation spreading, a spray coating cloth, and curtain spreading, may be used. moreover -- the latter approach -- the concentration of a solution -- 0.005 to 20 mass % -- it is 0.01% - 10 mass % preferably, and 0 degree C - 70 degrees C of dipping temperature are 5-60 degrees C preferably, and dipping time amount is 0.5 seconds - 120 seconds preferably for 0.1 seconds to 5 minutes.

[0133] the above-mentioned solution -- organic carboxylic acids, such as organic phosphonic acid, such as organic sulfonic acids, such as inorganic acids, such as alkalis, such as ammonia, triethylamine, and a potassium hydroxide, and a hydrochloric acid, a phosphoric acid, a sulfuric acid, a nitric acid, a nitrobenzene sulfonic acid, and a naphthalene sulfonic acid, and phenylphosphonic acid, a benzoic acid, coumaric acid, and a malic acid, etc. -- various -- organic chloride, such as organic-acid nature matter, naphthalene sulfonyl chloride, and benzenesulphonyl chloride, etc. -- pH -- adjusting -- pH=0-12 -- it can also be more preferably used in pH=0-6 Moreover, the matter which absorbs ultraviolet radiation, the light, infrared light, etc. for tone reproduction nature amelioration of the lithography version can also be added.

[0134] the amount of covering after desiccation of the compound which constitutes the interlayer of the lithography version original edition of this invention -- the sum total -- 1 - 100 mg/m2 suitable -- desirable -- 2 - 70 mg/m2 it is . The above-mentioned amount of covering is

1 mg/m². Sufficient effectiveness may not be acquired if few. Moreover, 100 mg/m² It is also the same as when many.

[0135] The sensible-heat layer in which the solubility over an alkaline water solution increases with heating in the lithography version original edition of <sensible-heat layer> this invention contains the positive type photosensitivity constituent for infrared laser (only henceforth "a photosensitive constituent"). The positive type photosensitivity constituent for infrared laser contained in a sensible-heat layer At least, it is resin (it is also called below an "alkali fusibility high molecular compound".) of (A) water-insoluble nature and alkali fusibility. While reducing the solubility to the alkali water solution of this high molecular compound by dissolving with (B) this alkali fusibility high molecular compound The compound to which this soluble fall operation decreases with heating, and the compound which absorbs (C) light and generates heat are contained, and the component of (D) and others is contained further if needed.

[0136] (A) What is not limited, can use a well-known thing conventionally, for example, has the following acid radical structures in the principal chain or side chain of a high molecular compound can be used especially for the alkali fusibility high molecular compound used for alkali fusibility high-molecular-compound this invention. A phenolic hydroxyl group ($-\text{Ar}-\text{OH}$), a carboxylic-acid radical ($-\text{CO}_3\text{H}$), a sulfonic group ($-\text{SO}_3\text{H}$), a phosphoric-acid radical ($-\text{OPO}_3\text{H}$), a sulfonamide radical ($-\text{SO}_2\text{NH}-\text{R}$), a permutation sulfonamide system acid radical (activity imide radical) ($-\text{SO}_2\text{NHCOR}$, $-\text{SO}_2\text{NH}\text{SO}_2\text{R}$, $-\text{CONHSO}_2\text{R}$). Here, Ar expresses the divalent aryl group which may have the substituent, and R expresses the hydrocarbon group which may have the substituent.

[0137] Especially, it is desirable that it is the high molecular compound which has the functional group of either (1) phenolic hydroxyl group, (2) sulfonamide radical and (3) activity imide radical in intramolecular. The high molecular compound which has a phenolic hydroxyl group in intramolecular especially is desirable. Such a high molecular compound is not limited to these, although the following are mentioned.

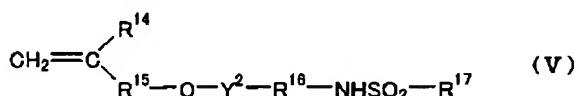
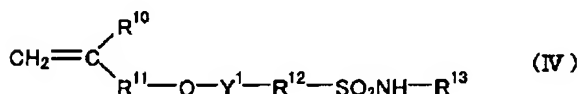
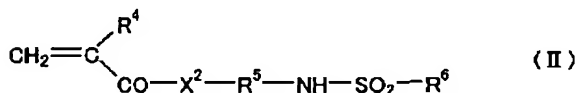
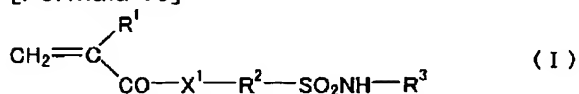
[0138] (1) As a high molecular compound which has a phenolic hydroxyl group, novolak resin and pyrogallol acetone resin, such as phenol formaldehyde resin, m-cresol formaldehyde resin, p-cresol formaldehyde resin, m-/p-mixing cresol formaldehyde resin, and a phenol / cresol (any of m-, p-, and m-/p-mixing are sufficient.) mixing formaldehyde resins, are mentioned, for example. It is desirable to, use for a side chain the high molecular compound which has a phenolic hydroxyl group in addition to this as a high molecular compound which has a phenolic hydroxyl group. The high molecular compound which is made to carry out homopolymerization of the polymerization nature monomer which becomes a side chain from the low molecular weight compound which has one or more unsaturated bonds in which a phenolic hydroxyl group and a polymerization are possible as a high molecular compound which has a phenolic hydroxyl group, respectively, or is made to carry out copolymerization of other polymerization nature monomers to this monomer, and is obtained is mentioned.

[0139] The acrylamide and methacrylamide which have a phenolic hydroxyl group as a polymerization nature monomer which has a phenolic hydroxyl group, for example, acrylic ester, methacrylic ester; hydroxystyrene is mentioned. Specifically N-(2-hydroxyphenyl) acrylamide, N-(3-hydroxyphenyl) acrylamide, N-(4-hydroxyphenyl) acrylamide, N-(2-hydroxyphenyl) methacrylamide, N-(3-hydroxyphenyl) methacrylamide, N-(4-hydroxyphenyl) methacrylamide, o-hydroxyphenyl acrylate, m-hydroxyphenyl acrylate, p-hydroxyphenyl acrylate, o-hydroxyphenyl methacrylate, m-hydroxyphenyl methacrylate, p-hydroxyphenyl methacrylate, o-hydroxystyrene, m-hydroxystyrene, p-hydroxystyrene, 2-(2-hydroxyphenyl) ethyl acrylate, 2-(3-hydroxyphenyl) ethyl acrylate, 2-(4-hydroxyphenyl) ethyl acrylate, 2-(2-hydroxyphenyl) ethyl methacrylate, 2-(3-hydroxyphenyl) ethyl methacrylate, 2-(4-hydroxyphenyl) ethyl methacrylate, 2-(N'-(4-hydroxyphenyl) ureido) ethyl acrylate, 2-(N'-(4-hydroxyphenyl) ureido) ethyl methacrylate, etc. can be used suitably. Furthermore, the condensation polymerization object of the phenol and formaldehyde which have an alkyl group of carbon numbers 3-8 like t-butylphenol formaldehyde resins and octyl phenol formaldehyde resins as substituents may be used together as indicated by the U.S. Pat. No. 4,123,279 specification. The resin which has this phenolic hydroxyl group may be used combining two or more sorts.

[0140] (2) The high molecular compound which is made to carry out homopolymerization of the polymerization nature monomer which has a sulfonamide radical as an alkali fusibility high molecular compound which has a sulfonamide radical for example, or is made to carry out copolymerization of other polymerization nature monomers to this monomer, and is obtained is mentioned. As a polymerization nature monomer which has a sulfonamide radical, the polymerization nature monomer which consists of a low molecular weight compound which has sulfonamide radical-NH-SO₂- which at least one hydrogen atom combined, and one or more unsaturated bonds in which a polymerization is possible, respectively on a nitrogen atom is mentioned, for example into 1 molecule. Also in it, the low molecular weight compound which has an acryloyl radical, an allyl group or a BINIROKISHI radical, and a mono-permutation amino sulfonyl group or a permutation sulfonyl imino group is desirable. As such a compound, the compound shown by following general formula (I) - (V) is mentioned, for example.

[0141]

[Formula 19]

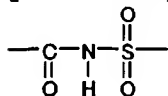


[0142] The inside of a formula, and X1 And X2 -O- or -NR7- is shown, respectively. R1 And R4 They are a hydrogen atom or -CH₃, respectively. It expresses. R2, R5, R9, and R12 and R16 express the alkylene group, the cyclo alkylene group, arylene radical, or aralkylene group of the carbon numbers 1-12 which may have the substituent, respectively. R3, and R7 and R13 express a hydrogen atom or the alkyl group of the carbon numbers 1-12 which may have the substituent, respectively, a cycloalkyl radical, an aryl group, or an aralkyl radical. Moreover, R6 And R17 shows the alkyl group, the cycloalkyl radical, aryl group, or aralkyl radical of the carbon numbers 1-12 which may have the substituent, respectively. R8, and R10 and R14 are a hydrogen atom or -CH₃. It expresses. R11 and R15 express the alkylene group, the cyclo alkylene group, arylene radical, or aralkylene group of the carbon numbers 1-12 which may have single bond or a substituent, respectively. Y1 And Y2 expresses single bond or -CO-, respectively. Specifically, m-aminosulfonylphenylmethacrylate, N-(p-amino sulfonyl phenyl) methacrylamide, N-(p-amino sulfonyl phenyl) acrylamide, etc. can be used suitably.

[0143] (3) As for the alkali fusibility high molecular compound which has an activity imide radical, what has in intramolecular the activity imide radical expressed with the following type is desirable, and the high molecular compound which is made to carry out homopolymerization of the polymerization nature monomer which serves as an activity imide radical expressed with the following formula in 1 molecule from the low molecular weight compound which has one or more unsaturated bonds in which a polymerization is possible, respectively, or is made to carry out copolymerization of other polymerization nature monomers to this monomer, and is obtained is mentioned as this high molecular compound.

[0144]

[Formula 20]



[0145] Specifically as such a compound, N-(p-tosyl) methacrylamide, N-(p-tosyl) acrylamide, etc. can be used suitably.

[0146] Furthermore, the high molecular compound to which the polymerization of the two or more sorts in the polymerization nature monomer which has said phenolic hydroxyl group, the polymerization nature monomer which has a sulfonamide radical, and the polymerization nature monomer which has an activity imide radical was carried out as an alkali fusibility high molecular compound used for this invention, or the high molecular compound which is made to carry out copolymerization of other polymerization nature monomers to these two or more sorts of polymerization nature monomers, and is obtained is mentioned suitably. When carrying out copolymerization of the polymerization nature monomer which has the polymerization nature monomer which has a sulfonamide radical, and/or an activity imide radical to the polymerization nature monomer which has a phenolic hydroxyl group, as for the combination mass ratio of these components, it is desirable that it is in the range of 50:50 to 5:95, and it is more desirable that it is in the range of 40:60 to 10:90.

[0147] the monomer which gives alkali fusibility when an alkali fusibility high molecular compound is the copolymer of the polymerization nature monomer which has said phenolic hydroxyl group, the polymerization nature monomer which has a sulfonamide radical or the polymerization nature monomer which has an activity imide radical, and other polymerization nature monomers -- more than 10 mol % -- what is included -- desirable -- more than 20 mol % -- what is included is more desirable. If there are few copolymerization components than ten-mol %, alkali fusibility tends to become inadequate and the improvement effectiveness of development latitude may not be attained enough.

[0148] Although the polymerization nature monomer which has said phenolic hydroxyl group, the polymerization nature monomer which has a sulfonamide radical or the polymerization nature monomer which has an activity imide radical, and the monomer mentioned to following the (1) - (12) as a monomer component which carries out copolymerization, for example can be used, it is not limited to these.

- (1) The acrylic ester and methacrylic ester which have aliphatic series hydroxyl groups, such as 2-hydroxyethyl acrylate and 2-hydroxyethyl methacrylate.
- (2) Alkyl acrylate, such as a methyl acrylate, an ethyl acrylate, acrylic-acid propyl, butyl acrylate, acrylic-acid amyl, acrylic-acid hexyl, acrylic-acid octyl, acrylic-acid benzyl, acrylic-acid-2-chloro ethyl, glycidyl acrylate, and N-dimethylamino ethyl acrylate.
- (3) Alkyl methacrylate, such as a methyl methacrylate, ethyl methacrylate, methacrylic-acid propyl, methacrylic-acid butyl, methacrylic-acid amyl, methacrylic-acid hexyl, cyclohexyl methacrylate, methacrylic-acid benzyl, methacrylic-acid-2-chloro ethyl, glycidyl methacrylate, and N-dimethylaminoethyl methacrylate.

[0149] (4) Acrylamide and methacrylamide, such as acrylamide, methacrylamide, N-methylol acrylamide, N-ethyl acrylamide, N-hexyl methacrylamide, N-cyclohexyl acrylamide, N-hydroxyethyl acrylamide, N-phenyl acrylamide, N-nitrophenyl acrylamide, and N-ethyl-N-phenyl acrylamide.

(5) Vinyl ether, such as ethyl vinyl ether, 2-chloro ethyl vinyl ether, hydroxyethyl vinyl ether, propyl vinyl ether, butyl vinyl ether, octyl vinyl ether, and phenyl vinyl ether

(6) Vinyl ester, such as vinyl acetate, vinyl chloro acetate, vinyl butyrate, and benzoic-acid vinyl

[0150] (7) Styrene, such as styrene, alpha methyl styrene, methyl styrene, and chloro methyl styrene

(8) Vinyl ketones, such as a methyl vinyl ketone, an ethyl vinyl ketone, a propyl vinyl ketone, and a phenyl vinyl ketone

(9) Olefins, such as ethylene, a propylene, an isobutylene, a butadiene, and an isoprene

- (10) N-vinyl pyrrolidone, N-vinylcarbazole, 4-vinylpyridine, acrylonitrile, a methacrylonitrile, etc.
 (11) Partial saturation imide, such as maleimide, N-acryloyl acrylamide, N-acetyl methacrylamide, N-propionyl methacrylamide, and N-(p-chloro benzoyl) methacrylamide.
 (12) Unsaturated carboxylic acid, such as an acrylic acid, a methacrylic acid, a maleic anhydride, and an itaconic acid.

[0151] As the approach of copolymerization of an alkali fusibility high molecular compound, the graft copolymerization method and block which are known conventionally can use heavy lawfulness, a random copolymerization method, etc.

[0152] When an alkali fusibility high molecular compound is the homopolymer or copolymer of the polymerization nature monomer which has said phenolic hydroxyl group, the polymerization nature monomer which has a sulfonamide radical, or the polymerization nature monomer which has an activity imide radical in this invention, weight average molecular weight is 2,000 or more, and that whose number average molecular weight is 500 or more is desirable. More preferably, weight average molecular weight is 5,000-300,000, number average molecular weight is 800-250,000, and degree of dispersion (weight average molecular weight/number average molecular weight) is 1.1-10. Moreover, when alkali fusibility high molecular compounds are resin, such as phenol formaldehyde resin and cresol aldehyde resin, in this invention, weight average molecular weight is 500-20,000, and that whose number average molecular weight is 200-10,000 is desirable.

[0153] In said copolymer, what has the combination mass ratio of the monomer which has the aforementioned (1) phenolic hydroxyl group, (2) sulfonamide radical, or (3) activity imide radical, and other monomers in the range of 50:50-5:95 from the point of development latitude is desirable, and the thing in the range of 40:60 to 10:90 is more desirable.

[0154] In this invention, the copolymer of the copolymer;2-(N'-(4-hydroxyphenyl) ureido) ethyl methacrylate / methyl methacrylate / acrylonitrile of novolak resin;N-(4-hydroxyphenyl) methacrylamide / methyl methacrylate / acrylonitrile, such as a condensation polymerization object of m-/p-mixing cresol and formaldehyde and a condensation polymerization object of a phenol, cresol, and formaldehyde, is mentioned as a high molecular compound which has a desirable phenolic hydroxyl group especially, for example. Moreover, in this invention, the copolymer of N-(p-amino sulfonyl phenyl) methacrylamide / methyl methacrylate / acrylonitrile is mentioned as a high molecular compound which has a desirable sulfonamide radical especially, for example. Moreover, in this invention, the copolymer of N-(p-tosyl) methacrylamide / methyl methacrylate / acrylonitrile / 2-hydroxyethyl methacrylate is mentioned as a high molecular compound which has a desirable activity imide radical especially, for example.

[0155] even if it uses these alkali fusibility high molecular compound independently, respectively -- two or more sorts -- combining -- you may use -- the inside of the total solids of a sensible-heat layer -- desirable -- 30 to 99 mass % -- more -- desirable -- 40 to 95 mass % -- it is especially used with the addition of 50 - 90 mass % preferably. If the endurance of a sensible-heat layer gets worse that the addition of an alkali fusibility high molecular compound is under 30 mass % and 99 mass % is exceeded, it is not desirable by both sides of sensibility and endurance.

[0156] (B) While reducing the solubility to the alkali water solution of this high molecular compound by dissolving with said alkali fusibility high molecular compound The (B) component of ***** to which this soluble fall operation decreases with heating While compatibility with (A) alkali fusibility high molecular compound is good and can form uniform coating liquid by work of the functional group of the hydrogen bond nature which exists in intramolecular, the compound which has the function which controls the alkali fusibility of this high molecular compound is pointed out by the interaction with the (A) component. Moreover, since there is a possibility that falling [of soluble depressant action] will become inadequate if sufficient energy for decomposition is not given by conditions, such as an output of laser and irradiation time, when this compound is a compound which the (B) component itself disassembles with heating, although this soluble fall operation is extinguished with heating, and sensibility may fall, as for the pyrolysis temperature of the (B) component, it is desirable that it is 150 degrees C or more.

[0157] As a suitable (B) component used for this invention, the compound which interacts with

the aforementioned (A) component of a sulfone compound, ammonium salt, phosphonium salt, an amide compound, etc. is mentioned, for example. (B) As the component was mentioned above, in consideration of the interaction with the (A) component, it should be chosen suitably, and when using novolak resin independently as a (A) component, specifically, cyanine-dye A illustrated later is used suitably.

[0158] (A) As for the compounding ratio of a component and the (B) component, it is usually desirable that it is the range of $99 / 1 - 75/25$. When there are few (B) components than $99/1$, an interaction with the (A) component becomes inadequate, alkali fusibility cannot be checked, and good image formation cannot be performed easily. Moreover, when there are more (B) components than $75/25$, since the interaction is excessive, sensibility falls remarkably, and neither is desirable.

[0159] (C) The compound which absorbs the light in compound this invention which absorbs light and generates heat, and generates heat has preferably 700nm or more of light absorption regions in a 750-1200nm infrared region, and points out what discovers light / thermal-conversion ability in the light of the wavelength of this range. Various pigments or colors which absorb the light of this wavelength region and specifically generate heat can be used. Said color is desirable at the point of excelling in image formation nature especially. As said pigment, the pigment indicated by a commercial pigment or a Color Index (C. I.) handbook, the "newest pigment handbook" (volume for Japanese pigment American Institute of Technology, 1977 annual publications), the "newest pigment applied technology" (CMC publication, 1986 annual publications) and "printing ink technical" CMC publication, and 1984 annual publications can be used.

[0160] As a class of said pigment, a black pigment, a yellow pigment, an orange pigment, brown pigments, red pigments, a purple pigment, a blue pigment, green pigments, a fluorescent pigment, a metallic flake pigment, and polymer joint coloring matter are mentioned, for example. Specifically, insoluble azo pigment, an azo lake pigment, a disazo condensation pigment, a chelate azo pigment, phthalocyanine pigment, an anthraquinone system pigment, perylene and a peri non system pigment, a thioindigo system pigment, the Quinacridone system pigment, a dioxazine system pigment, an isoindolinone system pigment, a kino FUTARON system pigment, a blue-and-white porcelain lake pigment, an azine pigment, a nitroso pigment, a nitro pigment, a natural pigment, a fluorescent pigment, an inorganic pigment, and carbon black can be used.

[0161] These pigments may be used without carrying out surface treatment, may perform surface treatment and may be used. The approach of carrying out the surface coat of resin or the wax, the approach to which a surfactant is made to adhere, the method of combining the active substance (for example, a silane coupling agent, an epoxy compound, poly isocyanate) with a pigment front face, etc. are mentioned to the approach of surface treatment. The above-mentioned surface treatment approach is indicated by "the property of metallic soap, application" (Saiwai Shobo), the "printing ink technique" (CMC publication, 1984 annual publications), and the "newest pigment applied technology" (CMC publication, 1986 annual publications).

[0162] It is desirable that it is in the range of 0.01-10 micrometers, as for the particle size of said pigment, it is more desirable that it is in the range which is 0.05-1 micrometer, and it is desirable that it is especially in the range which is 0.1-1 micrometer. When the particle size of a pigment is less than 0.01 micrometers, it is not desirable in respect of the stability in the inside of the sensible-heat layer coating liquid of a distributed object, and if it exceeds 10 micrometers, it is not desirable in respect of the homogeneity of a sensible-heat layer.

[0163] As an approach of distributing said pigment, the well-known distributed technique used for ink manufacture, toner manufacture, etc. can be used. As a disperser, an ultrasonic distribution machine, a sand mill, attritor, a pearl mill, a super mill, a ball mill, an impeller, DESUPAZA, KD mill, a colloid mill, a dynatron, 3 roll mills, and a pressurized kneader are mentioned, for example. For details, the "newest pigment applied technology" (CMC publication, 1986 annual publications) has a publication.

[0164] As said color, the well-known thing indicated by a commercial color and commercial reference (for example, "color handbook" Society of Synthetic Organic Chemistry, Japan edit, Showa 45 annual publications) can be used. Specifically, colors, such as azo dye, metallic

complex azo dye, pyrazolone azo dye, anthraquinone dye, phthalocyanine dye, a carbonium color, a quinonimine dye, methine dye, and cyanine dye, can be used.

[0165] In this invention, what absorbs infrared light or near-infrared light also in these pigments or a color is desirable at especially the point of being suitable for use of the laser which emits light in infrared light or near-infrared light.

[0166] As a pigment which absorbs such infrared light or near-infrared light, carbon black is used suitably. moreover, as a color which absorbs infrared light or near-infrared light For example, JP,58-125246,A, JP,59-84356,A, The cyanine dye indicated by JP,59-202829,A, JP,60-78787,A, etc., JP,58-173696,A, JP,58-181690,A, Methine dye, JP,58-112793,A which are indicated by JP,58-194595,A etc., JP,58-224793,A, JP,59-48187,A, The naphthoquinone color indicated by JP,59-73996,A, JP,60-52940,A, JP,60-63744,A, etc., Cyanine dye given in the SUKUWARIRIUMU coloring matter and the British patent No. 434,875 specification which are indicated by JP,58-112792,A etc., and a dihydroperi MIJIN squarylium color given in a U.S. Pat. No. 5,380,635 specification can be mentioned.

[0167] Moreover, the near-infrared absorption sensitizer of a publication is also suitably used for a U.S. Pat. No. 5,156,938 specification as said color. Moreover, the arylbenzo(thio)pyrylium salt by which the publication was permuted by the U.S. Pat. No. 3,881,924 specification, TORIMECHIN thia pyrylium salt given in JP,57-142645,A (U.S. Pat. No. 4,327,169 specification), JP,58-181051,A, JP,58-220143,A, JP,59-41363,A, JP,59-84248,A, JP,59-84249,A, The pyrylium system compound indicated by JP,59-146063,A and JP,59-146061,A, Pentamethine thio pyrylium salt etc. and JP,5-13514,B given in cyanine dye given in JP,59-216146,A, and a U.S. Pat. No. 4,283,475 specification, The pyrylium compound, Epolight which are indicated by JP,5-19702,B III-178, Epolight III-130, Epolight III-125, Epolight IV-62A etc. is used especially preferably.

[0168] moreover, the near-infrared absorption color indicated by the U.S. Pat. No. 4,756,993 detail in the letter as a formula (I) or (II) can be especially mentioned as another desirable example as said color.

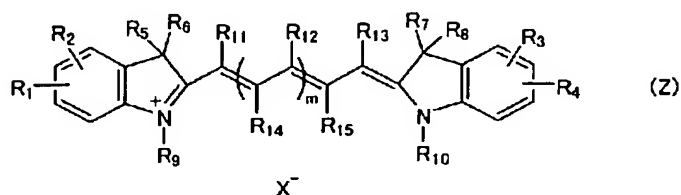
[0169] Cyanine dye, SUKUWARIRIUMU coloring matter, pyrylium salt, and a nickel thio rate complex are especially mentioned as a desirable thing among these colors.

[0170] these pigments or colors -- the total solids of a sensible-heat layer -- receiving -- desirable -- 0.01 to 50 mass % -- in the case of 0.5 to 10 mass %, and a pigment, more preferably, in the case of 0.1 to 10 mass %, and a color, preferably, 3.1 - 10 mass % can come out comparatively preferably, and it can add in said photosensitive constituent especially. Sensibility becomes it low that the addition of a pigment or a color is under 0.01 mass %, and if 50 mass % is exceeded, the homogeneity of a sensible-heat layer will be lost and the endurance of a sensible-heat layer will worsen. You may add in the same layer as other components, and these colors or pigments may prepare another layer, and may add it there. When considering as another layer, it is desirable to add to the layer which adjoins the layer containing the matter to which it is pyrolysis nature and the solubility of an alkali fusibility high molecular compound is substantially reduced in the condition of not decomposing. Moreover, another layer is sufficient although being contained in the same layer is desirable as for a color or a pigment, and an alkali fusibility high molecular compound.

[0171] (B+C) in component this invention, while reducing the solubility to the alkali water solution of this high molecular compound by dissolving with (B) alkali fusibility high molecular compound, it can replace with the compound to which this soluble fall operation decrease with heating, and the compound which absorb (C) light and generate heat, and one compound (also being able to call it "a component (B+C)" hereafter **) which have both properties can also be contain. As such a compound, what is expressed with the following general formula (Z) is mentioned, for example.

[0172]

[Formula 21]



[0173] The inside of said general formula (Z), and R1 –R4 The alkyl group, the alkenyl radical, the alkoxy group, cycloalkyl radical, or aryl group of the carbon numbers 1–12 which may have a hydrogen atom or a substituent independently, respectively is expressed, and it is R1. R2 and R3 R4 It may join together, respectively and the ring structure may be formed. Here, it is R1 –R4. If it carries out, specifically, a hydrogen atom, a methyl group, an ethyl group, a phenyl group, the dodecyl, a naphthyl group, a vinyl group, an allyl group, a cyclohexyl radical, etc. are mentioned. Moreover, when these radicals have a substituent, as the substituent, a halogen atom, a carbonyl group, a nitro group, a nitrile group, a sulfonyl group, a carboxyl group, carboxylate, a sulfonate, etc. are mentioned. R5 –R10 express the alkyl group of the carbon numbers 1–12 which may have a substituent independently, respectively, and, specifically, a methyl group, an ethyl group, a phenyl group, the dodecyl, a naphthyl group, a vinyl group, an allyl group, a cyclohexyl radical, etc. are mentioned as R5 –R10 here. Moreover, when these radicals have a substituent, as the substituent, a halogen atom, a carbonyl group, a nitro group, a nitrile group, a sulfonyl group, a carboxyl group, carboxylate, a sulfonate, etc. are mentioned.

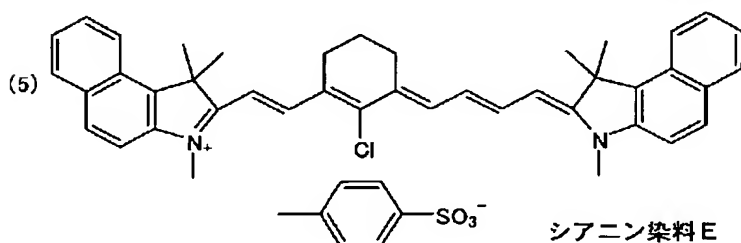
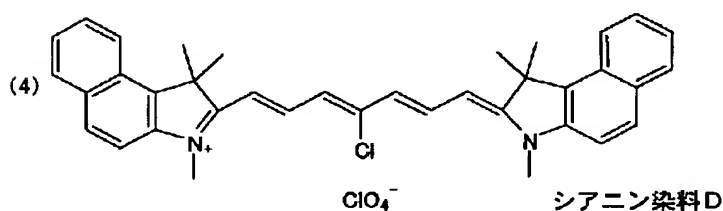
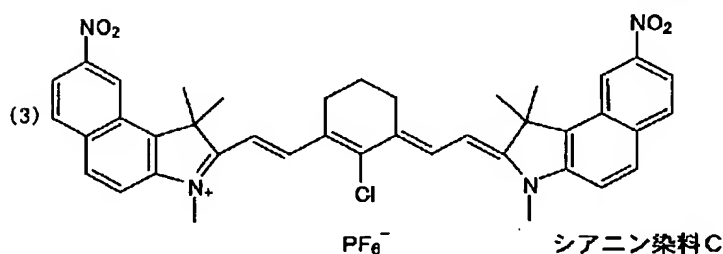
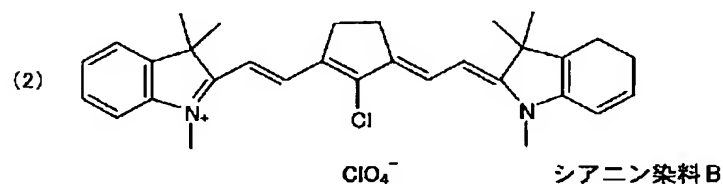
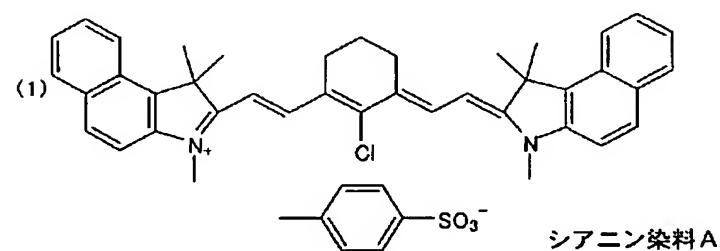
[0174] R11–R13 express the alkyl group of the carbon numbers 1–8 which may have independently a hydrogen atom, a halogen atom, or a substituent, respectively, R12 may combine with R11 or R13, and may form the ring structure, in the case of $m > 2$, two or more R12 comrades may join together, and the ring structure may be formed here. Specifically as R11–R13, a cyclopentyl ring, a cyclohexyl ring, etc. which a chlorine atom, a cyclohexyl radical, and R12 comrades come to join together are mentioned. Moreover, when these radicals have a substituent, as the substituent, a halogen atom, a carbonyl group, a nitro group, a nitrile group, a sulfonyl group, a carboxyl group, carboxylate, a sulfonate, etc. are mentioned. Moreover, m expresses the integer of 1–8 and is 1–3 preferably. R14 and R15 express the alkyl group of the carbon numbers 1–8 which may have independently a hydrogen atom, a halogen atom, or a substituent, respectively, R14 may combine with R15 and may form the ring structure, in the case of $m > 2$, two or more R14 comrades may join together, and the ring structure may be formed. Specifically as R14 and R15, a cyclopentyl ring, a cyclohexyl ring, etc. which a chlorine atom, a cyclohexyl radical, and R14 comrades come to join together are mentioned. Moreover, when these radicals have a substituent, as the substituent, a halogen atom, a carbonyl group, a nitro group, a nitrile group, a sulfonyl group, a carboxyl group, carboxylate, a sulfonate, etc. are mentioned. Moreover, m expresses the integer of 1–8 and is 1–3 preferably.

[0175] It sets to said general formula (Z), and is X. – An anion is expressed. As an example of the compound used as an anion, 4 perchloric acid, boric-acid fluoride A 6 phosphorus-fluoride acid, a triisopropyl naphthalene sulfonic acid, 5-nitro-o-toluenesulfonic acid, 5-sulfosalicylic acid, 2, 5-dimethylbenzene sulfonic acid, 2 and 4, 6-trimethyl benzenesulfonic acid, 2-nitrobenzene sulfonic acid, 3-chlorobenzene sulfonic acid, 3-bromobenzene sulfonic acid, 2-fluoro capryl lactam naphthalene sulfonic acid, dodecylbenzenesulfonic acid, a 1-naphthol-5-sulfonic acid, 2-methoxy-4-hydroxy-5-benzoyl-benzenesulfonic acid, and Para toluenesulfonic acid are mentioned. Also in these, a 6 phosphorus-fluoride acid, a triisopropyl naphthalene sulfonic acid, and alkyl aromatic series sulfonic acids, such as 2 and 5-dimethylbenzene sulfonic acid, are used especially preferably.

[0176] This invention is not limited by this example, although the compound expressed with said general formula (Z) is a compound generally called cyanine dye and the compound shown below is specifically used suitably.

[0177]

[Formula 22]



[0178] It has the property (namely, property of the (C) component) for the aforementioned (B+C) component to absorb light and to generate heat. And have an absorption region in a 700–1200nm infrared region, and compatibility with an alkali fusibility high molecular compound is also still better. Since it has the radical which is basic dye and interacts with alkali fusibility high molecular compounds, such as ammonium and an iminium radical, to intramolecular (that is, it has the property of the (B) component) It can interact with this high molecular compound, the alkali fusibility can be controlled, and it can use suitable for this invention.

[0179] In this invention, when using the compound (B+C) component which replaces with the (B) component and the (C) component, and has the property of both sides like the aforementioned cyanine dye, as for the addition of this compound, it is desirable from a viewpoint of sensibility that it is the range of 99 / 1 – 70/30 to the (A) component, and it is more desirable that it is the range of 99 / 1 – 75/25.

[0180] (D) In said photosensitive constituent used for other component this inventions, various additives can be added further if needed. For example, cyclic anhydrides, phenols, organic acids, and sulfonyl compounds can also be used together in order to raise sensibility. As cyclic anhydrides, phthalic anhydride [which is indicated by the U.S. Pat. No. 4,115,128 specification], tetrahydro phthalic anhydride, hexahydro phthalic anhydride, 3, and 6- and oxy--delta4-

tetrahydro phthalic anhydride, tetra-KURORU phthalic anhydride, a maleic anhydride, the Krol maleic anhydride, alpha-phenyl maleic anhydride, a succinic anhydride, and pyromellitic dianhydride are mentioned, for example. as phenols -- for example -- bisphenol A, p-nitrophenol, a p-ethoxy phenol, 2 and 4, a 4'-trihydroxy benzophenone, 2 and 3, 4-trihydroxy benzophenone, a 4-hydroxy benzophenone, 4, 4', and 4''- trihydroxy triphenylmethane color, 4, 4', 3'', 4''- tetra-- hydroxy one - a 3, 5, 3', and 5'-tetramethyl triphenylmethane color is mentioned.

[0181] As organic acids, the sulfonic acids indicated by JP,60-88942,A, JP,2-96755,A, etc., sulfinic acids, alkyl sulfuric acid, phosphonic acid, phosphoric ester, and carboxylic acids are mentioned, for example. Specifically, p-toluenesulfonic acid, dodecylbenzenesulfonic acid, p-toluene sulfinic acid, ethyl sulfuric acid, phenylphosphonic acid, phenyl phosphinic acid, phosphoric-acid phenyl, phosphoric-acid diphenyl, a benzoic acid, isophthalic acid, an adipic acid, para toluylic acid, 3, 4-dimethoxy benzoic acid, a phthalic acid, a terephthalic acid, the 4-cyclohexene -1, 2-dicarboxylic acid, an erucic acid, a lauric acid, an n undecane acid, an ascorbic acid, a bis-hydroxyphenyl sulfone, a methylphenyl sulfone, and diphenyl disulfon are mentioned.

[0182] It is desirable that it is 0.05 to 20 mass %, as for the rate of occupying in the solid content of said photosensitive constituent of the above-mentioned cyclic anhydride, phenols, organic acids, and sulfonyl compounds, it is more desirable that it is 0.1 to 15 mass %, and it is desirable that it is especially 0.1 to 10 mass %.

[0183] Moreover, in said photosensitive constituent in this invention, since the stability of the processing to development conditions is extended, a nonionic surface active agent which is indicated by JP,62-251740,A and JP,3-208514,A, and an amphoteric surface active agent which is indicated by JP,59-121044,A and JP,4-13149,A can be added. As an example of said nonionic surface active agent, sorbitan tristearate, sorbitan monopalmitate, a sorbitan trio rate, a stearin acid monoglyceride, polyoxyethylene sorbitan mono-olate, and the polyoxyethylene nonylphenyl ether are mentioned. As an example of said amphoteric surface active agent, alkyl di(aminoethyl) glycine, alkylpolyamino ethylglycine hydrochloride, 2-alkyl-N-carboxy ethyl-N-hydroxyethyl-imidazolium-betaine, N-tetradecyl-N, and N-betaine mold (for example, a trade name "Amogen K", the first industrial company make) and an alkyl imidazoline system (for example, a trade name "REBON 15", Mitsuhiro formation shrine make) are mentioned. As for the rate of occupying in the solid content of said photosensitive constituent of the above-mentioned nonionic surface active agent and an amphoteric surface active agent, it is desirable that it is 0.05 to 15 mass %, and it is more desirable that it is 0.1 to 5 mass %.

[0184] Into said photosensitive constituent used for this invention, the color and pigment as the baked appearance electuarium and the image coloring agent for obtaining a visible image immediately after heating by exposure can be added. The combination of the compound (photo-oxide emission agent) which emits an acid with heating by exposure as baked appearance electuarium, and the organic dye which can form a salt is illustrated. The combination of the trihalomethyl compound and salt plasticity organic dye which are specifically indicated by the combination of o-naphthoquinonediazide-4-sulfonic-acid halo GENIDO indicated by JP,50-36209,A and JP,53-8128,A and salt plasticity organic dye, JP,53-36223,A and JP,54-74728,A, JP,60-3626,A, JP,61-143748,A, JP,61-151644,A, and JP,63-58440,A is mentioned. as this trihalomethyl compound, there are an oxazole system compound and triazine compound, and it passes through all, excels in the Tokiyasu quality, and clear -- appearance is burned and carried out and an image is given.

[0185] As an image coloring agent, other colors can be used in addition to the above-mentioned salt plasticity organic dye. An oil color and basic dye are mentioned as a suitable color including salt plasticity organic dye. Specifically For example, oil yellow #101, oil yellow #103, oil pink #312, oil green BG Oil blue BOS, oil blue #603, oil black BY, Oil black BS, oil black T-505 (above the ORIENT chemical-industry company make), Victoria pure blue, a crystal violet (C. I.42555), Methyl Violet (C. I.42535), ethyl violet, Rhodamine B (C. I.145170B), Malachite Green (C. I.42000), and a methylene blue (C. I.52015) are mentioned. Moreover, especially the color indicated by JP,62-293247,A and JP,5-313359,A is desirable. these colors -- the solid content of said photosensitive constituent -- receiving -- desirable -- 0.01 to 10 mass % -- 0.1 - 3 mass % can come out comparatively more preferably, and it can add in said photosensitive constituent.

[0186] Moreover, a plasticizer is added in order to give the flexibility of a paint film etc. if needed into said photosensitive constituent used for this invention. For example, the oligomer and the polymer of butyl phthalyl, a polyethylene glycol, tributyl citrate, a diethyl phthalate, dibutyl phthalate, phthalic-acid dihexyl, a dioctyl phthalate, tricresyl phosphate, tributyl phosphate, trioctyl phosphate, tetrahydrofurfuryl oleate, an acrylic acid, or a methacrylic acid are used. Furthermore, in said photosensitive constituent used for this invention, the compound disassembled by light, such as quinone diazide and a diazo compound, may be added if needed. As for the addition of these compounds, it is desirable that it is one to 5 mass % to the solid content of said photosensitive constituent.

[0187] The sensible-heat layer concerning this invention can usually melt each above-mentioned component to a solvent, and can manufacture it by applying on a suitable base material. As a solvent used here, for example Ethylene dichloride, a cyclohexanone, A methyl ethyl ketone, a methanol, ethanol, propanol, ethylene glycol monomethyl ether, 1-methoxy-2-propanol, 2-methoxy ethyl acetate, 1-methoxy-2-propyl acetate, dimethoxyethane, methyl lactate, Although ethyl lactate, N,N-dimethylacetamide, N,N-dimethylformamide, tetramethyl urea, N-methyl pyrrolidone, dimethyl sulfoxide, a sulfolane, gamma-butyrolactone, toluene, and water can be mentioned, it is not limited to these. These solvents are independent, or are mixed and used. The concentration of the above-mentioned component in a solvent (total solids containing an additive) is one to 50 mass % preferably.

[0188] moreover, the sensible-heat layer coverage on the base material obtained after spreading desiccation (solid content) -- 0.5 - 5.0 g/m² it is -- a thing is desirable.

[0189] As an approach of applying, although various approaches can be used, bar coating-machine spreading, rotation spreading, a spray coating cloth, curtain spreading, DIP spreading, the Ayr knife spreading, blade spreading, and roll coating are mentioned, for example. Although apparent sensibility becomes large as coverage decreases, the coat property of a film falls.

[0190] The surfactant for raising spreading nature in said sensible-heat layer, for example, a fluorochemical surfactant which is indicated by JP,62-170950,A, can be added. A desirable addition is 0.01 to 1 mass % to the total solids of said sensible-heat layer, and is 0.05 to 0.5 mass % more preferably.

[0191] In this invention as a thermal type sensitization layer for the laser straight-writing mold lithography versions For example, JP,9-90610,A, JP,11-44956,A, JP,11-84657,A, JP,11-119418,A, JP,11-119419,A, JP,11-174681,A, JP,11-218914,A, JP,11-305435,A, JP,2000-25352,A, JP,2000-35666,A, JP,2000-108538,A, JP,2000-187318,A, The sensitization layer of a publication and a recording layer are applicable to a Japanese-Patent-Application-No. No. 143280 [11 to] specification, a Japanese-Patent-Application-No. No. 169167 [11 to] specification, a Japanese-Patent-Application-No. No. 190262 [11 to] specification, a Japanese-Patent-Application-No. No. 209001 [11 to] specification, and a Japanese-Patent-Application-No. No. 240384 [11 to] specification.

[0192] The <image recording layer A-2> image recording layer A-2 is a positive type sensible-heat layer of two-layer structure, and has the sensible-heat layer prepared in the location near a front face (exposure side), and a lower layer containing the alkali fusibility resin prepared in the side near a base material. The sensible-heat layer which each of these layers contains the resin of water-insoluble nature and alkali fusibility, and is located in the upper part contains the compound which absorbs light and generates heat. Hereafter, each constituent of this image recording layer A-2 is explained.

[0193] The resin of the water-insoluble nature used for a <resin of water-insoluble nature and alkali fusibility> sensible-heat layer and a lower layer and alkali fusibility includes the homopolymers which contain an acidic group in the principal chain and/or side chain in a macromolecule, these copolymers, or such mixture. Since the lower layer and sensible-heat layer which are used for this invention contain an alkali fusibility macromolecule, they have the property which will be dissolved if an alkaline developer is contacted. The resin of the water-insoluble nature used for a lower layer and a sensible-heat layer and alkali fusibility, its addition, etc. are the same as that of explanation of "(A) alkali fusibility high molecular compound" used for the image recording layer A-1 mentioned above.

[0194] Since lower layer solubility can be held good to the alkali developer with which acrylic resin uses as a principal component the organic compound which has buffer action, and a base as an alkali fusibility high molecular compound used for a lower layer, it is desirable from a viewpoint of the image formation at the time of development. Furthermore, especially the thing that has a sulfo amide group as this acrylic resin is desirable. Moreover, since image formation nature improves to the point that occur strong hydrogen bond nature in the unexposed section as an alkali fusibility high molecular compound used for a sensible-heat layer, and a part of hydrogen bond is easily canceled in the exposure section, and a non-silicate developer, from the point that the difference of the development nature of the unexposed section and the exposure section is large, the resin which has a phenolic hydroxyl group is desirable. Especially, novolak resin is desirable.

[0195] The compound which absorbs the light used for a <compound which absorbs light and generates heat> sensible-heat layer, and generates heat, its addition, etc. are the same as that of explanation of "(C) Compound which absorbs light and generates heat" used for the image recording layer A-1 mentioned above.

[0196] The compound which absorbs light and generates heat can be added not only in a sensible-heat layer but in a lower layer. A lower layer can also be operated as a lower layer as a sensible-heat layer by adding the compound which absorbs light and generates heat. The compound which absorbs the light contained in a lower layer and generates heat may be the same as the compound which absorbs the light contained in a sensible-heat layer, and generates heat, and may differ. Moreover, you may add in the same layer as other components, and the compound which absorbs such light and generates heat may prepare another layer, and may add it there. When considering as another layer, it is desirable to add to the layer which adjoins a sensible-heat layer. Moreover, although being contained in the same layer is desirable as for the compound and alkali fusibility high molecular compound which absorb light and generate heat, another layer is sufficient as them.

[0197] In addition to the above-mentioned indispensable component, a <other component> lower layer and a sensible-heat layer are the range which does not spoil the purpose of this invention, and can contain various additives if needed. Only a lower layer may be made to contain an additive, only a sensible-heat layer may be made to contain it, and both layers may be made to contain it. Hereafter, the example of an additive is given and explained.

[0198] For example, it is pyrolysis nature, and if the matter to which the solubility of an alkali water-soluble high molecular compound is substantially reduced in the condition of not decomposing is used together, since improvement in the lysis inhibition nature to the developer of the image section can be aimed at, it is desirable. As such matter, an onium salt, quinone diazide, an aromatic series sulfone compound, an aromatic series sulfonate compound, and a polyfunctional amine compound are mentioned, for example.

[0199] As an onium salt, diazonium salt, ammonium salt, phosphonium salt, iodonium salt, sulfonium salt, a seleno NIUMU salt, and arsonium salt are mentioned, for example.

[0200] Especially as a suitable thing, for example S.I.Schlesinger, Photogr.Sci.Eng., 18,387 (1974), T. S.Balet Diazonium salt indicated by al, Polymer21,423 (1980), and JP,5-158230,A, The ammonium salt indicated by a U.S. Pat. No. 4,069,055 specification, this No. 4,069,056 specification, and JP,3-140140,A, D.C.Necker et 17 al, Macromolecules, 2468 (1984), C. S.Wenet al, Teh, Proc.Conf.Rad.Curing ASIA, p.478, Tokyo, Oct (1988), The phosphonium salt indicated by the U.S. Pat. No. 4,069,055 specification and this No. 4,069,056 specification, J. V.Crivello et al, Macromolecules, 10 (6), 1307 (1977) Chem.& amp, Eng.News, Nov.28, p31 (1988), The Europe patent No. 104,143 specification, a U.S. Pat. No. 339,049 specification, The iodonium salt indicated by a 410,201 specification, JP,2-150848,A, and JP,2-296514,A, J. -- V.Crivello et al and Polymer J. -- 17 and 73 (1985) -- J. V.Crivello et 43 al.J.Org.Chem., 3055 (1978), W. R.Watt et al, J.Polymer Sci., Polymer 22 Chem.Ed., 1789 (1984), J. V.Crivello et al, Polymer Bull., 14,279 (1985), J. V.Crivello et al, Macromolecules14 (5), 1141 (1981), J.V.Crivello et al, J.Polymer Sci., Polymer 17 Chem.Ed., 2877 (1979), The Europe patent No. 370,693 specification, this No. 233,567 specification, this No. 297,443 specification, This No. 297,442 specification, a U.S. Pat. No. 4,933,377 specification, This No. 3,902,114 specification, this No. 410,201 specification, this No.

339,049 specification, This No. 4,760,013 specification, this No. 4,734,444 specification, this No. 2,833,827 specification, The sulfonium salt indicated by the German country patent No. 2,904,626 specification, this No. 3,604,580 specification, and this No. 3,604,581 specification, J. V.Crivello et al, Macromolecules 10 (6), 1307 (1977) and J.V.Crivello et al, J.Polymer Sci., Polymer Chem.Ed., the seleno NIUMU salt indicated by 17 and 1047 (1979), C. S.Wen et al, Teh, Proc.Conf.Rad.Curing The arsonium salt indicated by ASIA, p478, Tokyo, and Oct (1988) is mentioned.

[0201] Also in an onium salt, especially diazonium salt is desirable. Moreover, what is especially indicated by JP,5-158230,A as suitable diazonium salt is raised.

[0202] As a counter ion of an onium salt, for example 4 boric-acid fluoride, a 6 phosphorus-fluoride acid, A triisopropyl naphthalene sulfonic acid, 5-nitro-o-toluenesulfonic acid, 5-sulfosalicylic acid, 2, 5-dimethylbenzene sulfonic acid, 2 and 4, 6-trimethyl benzenesulfonic acid, 2-nitrobenzene sulfonic acid, 3-chlorobenzene sulfonic acid, 3-bromobenzene sulfonic acid, 2-fluoro capryl lactam naphthalene sulfonic acid, dodecylbenzenesulfonic acid, a 1-naphthol-5-sulfonic acid, 2-methoxy-4-hydroxy-5-benzoyl-benzenesulfonic acid, and Para toluenesulfonic acid are mentioned. Especially, alkyl aromatic series sulfonic acids, such as 6 phosphorus-fluoride acid; triisopropyl naphthalene sulfonic-acid, 2, and 5-dimethylbenzene sulfonic acid, are desirable.

[0203] As quinone diazide, o-quinone diazide compound is desirable. o-quinone diazide compound used for this invention has at least one o-quinone diazide radical, it is a compound which increases alkali fusibility by the pyrolysis, and the compound of various structures can be used for it. o-quinone diazide compound raises the solubility of a sensitized material system according to the effectiveness of making the dissolution control ability of a binder lose by the pyrolysis, and the o-quinone diazide compound itself changing [both] to the matter of alkali fusibility.

[0204] Although the compound indicated by J. Koser work "light-sensitive systems" (John Wiley & Sons, Inc.) p.339-352 can be used as an o-quinone diazide compound used for this invention, for example, the sulfonate or sulfonic-acid amide of various aromatic series polyhydroxy compounds or the aromatic series amino compound, and o-quinone diazide compound made to react is especially suitable. Moreover, benzoquinone (1 2)-diazido sulfonic-acid chloride or a naphthoquinone which is indicated by JP,43-28403,B -(1 2)- Benzoquinone indicated by the ester of diazido-5-sulfonic-acid chloride and pyrogallol-acetone resin, the U.S. Pat. No. 3,046,120 specification, and the 3,188,210 specification -(1 2)- Diazido sulfonic-acid chloride or naphthoquinone -(1 2)- The ester of diazido-5-sulfonic-acid chloride and phenol-formaldehyde resin is also used suitably.

[0205] Furthermore, naphthoquinone -(1 2)- Ester with diazido-4-sulfonic-acid chloride, phenol formaldehyde resin, or cresol formaldehyde resin, naphthoquinone -(1 2)- The ester of diazido-4-sulfonic-acid chloride and pyrogallol-acetone resin is used suitably similarly. In addition to this, useful o-quinone diazide compound is reported to much patents, and is known. For example, JP,47-5303,A, JP,48-63802,A, JP,48-63803,A, JP,48-96575,A, JP,49-38701,A, JP,48-13354,A, JP,41-11222,B, JP,45-9610,B, JP,49-17481,B, a U.S. Pat. No. 2,797,213 specification, A 3,454,400 specification, a 3,544,323 specification, A 3,573,917 specification, a 3,674,495 specification, A 3,785,825 specification, the British patent No. 1,227,602 specification, What is indicated by a 1,251,345 specification, the 1,267,005 specification, the 1,329,888 specification, the 1,330,932 specification, and the German country patent No. 854,890 specification is mentioned.

[0206] the total solids of the layer by which each addition of an onium salt and o-quinone diazide compound is added -- receiving -- desirable -- one to 50 mass % -- more -- desirable -- five to 30 mass % -- it is ten to 30 mass % especially preferably. These compounds may be used independently and may be used as two or more sorts of mixture.

[0207] the total solids of the layer by which the addition of additives other than an onium salt and o-quinone diazide compound is added -- receiving -- desirable -- one to 50 mass % -- further -- desirable -- five to 30 mass % -- it is ten to 30 mass % especially preferably. As for an additive and an alkali fusibility high molecular compound, in this invention, it is desirable to make it contain to the same layer.

[0208] Moreover, a lower layer and a sensible-heat layer are the purposes which strengthen the drag force to the discrimination of an image, or surface cracks, and it is desirable to contain the polymer which uses as a polymerization component 2 or the acrylate monomer which it has three pieces (meta) for the perfluoroalkyl radical of carbon numbers 3-20 in a molecule which is indicated by JP,2000-187318,A. Although any of a lower layer and a sensible-heat layer may be made to contain it, if the sensible-heat layer located in the upper part is made to contain such a polymer, it is more effective. As for the addition of such a polymer, it is desirable that it is 0.1 to 10 mass % to the total solids of the layer added, and it is more desirable that it is 0.5 to 5 mass %.

[0209] Moreover, a lower layer and a sensible-heat layer are the purposes which give the resistance over a crack, and can also contain the compound to which a surface coefficient of static friction is reduced. As such a compound, the ester of a long-chain alkyl carboxylic acid which is indicated by the U.S. Pat. No. 6,117,913 specification is mentioned, for example. Although any of a lower layer and a sensible-heat layer may be made to contain it, if the sensible-heat layer located in the upper part is made to contain such a compound, it is more effective. As for the addition of such a compound, it is desirable that it is 0.1 to 10 mass % to the total solids of the layer added, and it is more desirable that it is 0.5 to 5 mass %.

[0210] Moreover, the lower layer and the sensible-heat layer may contain the compound which has the acidic group of low molecular weight if needed. As an acidic group, a sulfonic group, a carboxy group, and a phosphoric-acid radical are mentioned, for example. Especially, the compound which has a sulfonic group is desirable. Specifically, aromatic series sulfonic acids, such as p-toluenesulfonic acid and a naphthalene sulfonic acid, and aliphatic series sulfonic acids are mentioned. Any of a lower layer and a sensible-heat layer may be made to contain such a compound. As for the addition of such a compound, it is desirable that it is 0.05 to 5 mass % to the total solids of the layer added, and it is more desirable that it is 0.1 to 3 mass %. If [than 5 mass %] more, since the solubility over the developer of each class may increase, it is not desirable.

[0211] Moreover, the lower layer and the sensible-heat layer may contain dissolution inhibitors various for the purpose which adjusts the solubility of each class. As a dissolution inhibitor, a disulfon compound or a sulfone compound which is indicated by JP,11-119418,A is used suitably. Specifically, a 4 and 4'-bis-hydroxyphenyl sulfone is illustrated suitably. Any of a lower layer and a sensible-heat layer may be made to contain a dissolution inhibitor. As for the addition of a dissolution inhibitor, it is desirable that it is 0.05 to 20 mass % to the total solids of the layer added, and it is more desirable that it is 0.5 to 10 mass %.

[0212] Moreover, a lower layer and a sensible-heat layer are the purposes which raise sensibility further, and can also contain cyclic anhydrides, phenols, and organic acids. Cyclic anhydrides, phenols, organic acids, those additions, etc. are the same as that of explanation of "(D) Other components" used for the image recording layer A-1 mentioned above.

[0213] Moreover, since a lower layer and a sensible-heat layer extend the stability of the processing to change of development conditions, they can contain an amphoteric surface active agent which is indicated by a nonionic surface active agent, JP,59-121044,A, and JP,4-13149,A which are indicated by JP,62-251740,A and JP,3-208514,A, a siloxane system compound which is indicated by the Europe patent application public presentation No. 950,517 specification, and the monomer copolymer of fluorine content which is indicated by JP,11-288093,A.

[0214] What was enumerated of "(D) Other components" used for the image recording layer A-1 mentioned above as an example of a nonionic surface active agent and an amphoteric surface active agent, and the same thing are mentioned. As a siloxane system compound, the block copolymer of dimethylsiloxane and polyalkylene oxide is desirable, and it is Tego made from DBE-224 by Chisso Corp., DBE-621, DBE-712, DBP-732, DBP-534, and German Tego as an example. The polyalkylene oxide denaturation silicone of Glide100 grade is mentioned. Respectively, as for the addition of the above-mentioned nonionic surface active agent, an amphoteric surface active agent, and a siloxane system compound, it is desirable that it is 0.05 to 15 mass % to the total solids of the layer added, and it is more desirable that it is 0.1 to 5 mass %.

[0215] Moreover, a lower layer and a sensible-heat layer can contain the color and pigment as the baked appearance electuarium and the image coloring agent for obtaining a visible image immediately after heating by exposure. baked appearance electuarium and an image coloring agent -- the addition of them etc. is the same as that of explanation of "(D) other components" used for the image recording layer A-1 mentioned above.

[0216] Moreover, a lower layer and a sensible-heat layer can contain a plasticizer if needed, in order to give the flexibility of a paint film etc. What was enumerated of "(D) Other components" used for the image recording layer A-1 mentioned above as an example of a plasticizer, and the same thing are mentioned.

[0217] A lower layer and a sensible-heat layer can usually melt each above-mentioned component to a solvent, and can manufacture it by applying on the above-mentioned base material for the lithography versions. What was enumerated of "(D) Other components" used for the image recording layer A-1 mentioned above as a solvent used here, and the same thing are mentioned. These solvents are independent, or are mixed and used.

[0218] As for a solvent, it is desirable that it is that from which solubility differs to the alkali fusibility high molecular compound used for a sensible-heat layer and the alkali fusibility high molecular compound used for a lower layer. In case it is adjoined and the sensible-heat layer which is the upper layer is applied, after applying a lower layer, when the solvent which is dissolved and deals in a lower layer alkali fusibility high molecular compound as an upper spreading solvent is used, it becomes impossible to disregard mixing by the layer interface, and when extreme, it may not become multistory but may become a uniform monolayer. Thus, when mixing arises in the interface of two adjoining layers, or it dissolves mutually and behavior like a homogeneity layer is shown, there is a possibility that the effectiveness of the lithography version original edition of this invention by having a bilayer may be spoiled, and it is not desirable. For this reason, as for the solvent used for applying a sensible-heat layer, it is desirable that it is a poor solvent to the alkali fusibility high molecular compound contained in a lower layer.

[0219] The concentration of the above-mentioned component in the solvent in the case of applying each class (total solids containing an additive) is one to 50 mass % preferably.

[0220] moreover -- although the coverage (solid content) of the lower layer on the base material obtained after spreading desiccation and a sensible-heat layer changes with applications -- a sensible-heat layer -- 0.05 - 1.0 g/m² it is -- a thing -- desirable -- moreover, a lower layer -- 0.3 - 3.0 g/m² it is -- a thing is desirable. The coverage of a sensible-heat layer is 0.05 g/m². When it is the following, image formation nature may fall, and it is 1.0 g/m². If it exceeds, sensibility may fall. Moreover, lower layer coverage is 0.3 g/m². 3.0 g/m² when it is the following In exceeding, there is an inclination for image formation nature to all fall. moreover, the coverage of a lower layer and a sensible-heat layer -- the sum total of a bilayer -- 0.5 - 3.0 g/m² it is -- a thing is desirable. The coverage of the sum total of a bilayer is 0.5 g/m². A coat property may fall that it is the following and it is 3.0g/m². When it exceeds, it is in the inclination for sensibility to fall. Although apparent sensibility becomes large as coverage decreases, the coat property of a film falls.

[0221] As an approach of applying, various approaches can be used and the same thing as the case where it is the image recording layer A-1 mentioned above is mentioned.

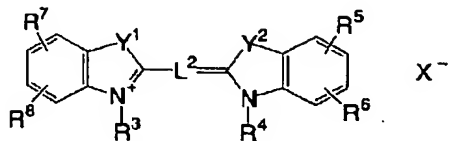
[0222] Moreover, a lower layer and a sensible-heat layer can contain the surfactant for raising spreading nature, for example, a fluorochemical surfactant which is indicated by JP,62-170950,A. As for the addition of the surfactant for raising spreading nature, it is desirable that it is 0.01 to 1 mass % to the total solids of the layer added, and it is more desirable that it is 0.05 to 0.5 mass %.

[0223] The <image recording layer A-3> image recording layer A-3 contains the cyanine dye expressed with the following general formula (I), and the resin of water-insoluble nature and alkali fusibility. The lithography version original edition which has the image recording layer A-3 applies the sensitization layer coating liquid which, for example, made the solvent system in which the boiling point contains a less than 100-degree C solvent 80% or more make dissolve it or distribute the photosensitive constituent containing these components on an aluminum base material, dries it, makes a sensitization layer form, and is obtained.

[0224]

[Formula 23]

一般式 (I)



[0225] The inside of a formula, and Y1 And Y2 A dialkyl methylene group or a sulfur atom is shown independently, respectively. R3 And R4 The alkyl group and alkenyl radical which may have the substituent, an alkynyl group, or a phenyl group is shown independently, respectively. L2 The trimethine group, pentamethine radical, or hepta-methine group which may have the substituent is shown, and a pentamethine radical or two substituents on a hepta-methine group may connect mutually, and may form the cycloalkene ring of carbon numbers 5-7. R5 -R8 The alkyl group and alkenyl radical which may have the hydrogen atom or the substituent, an alkoxy group, a cycloalkyl radical, or an aryl group is shown independently, respectively. R5, R6, and R7 R8 It may join together, respectively and the ring structure may be formed. X - An anion is shown.

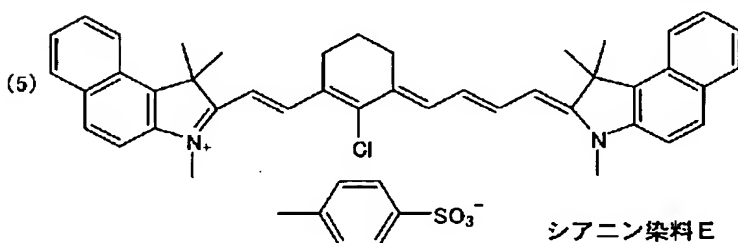
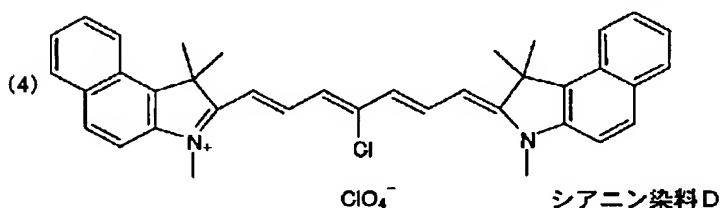
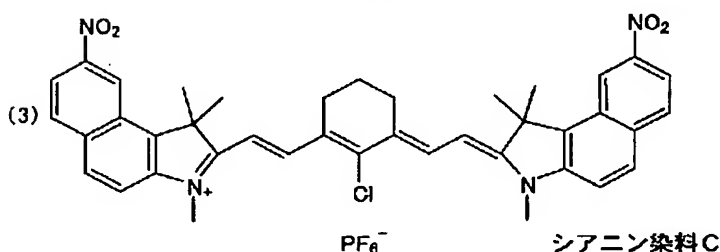
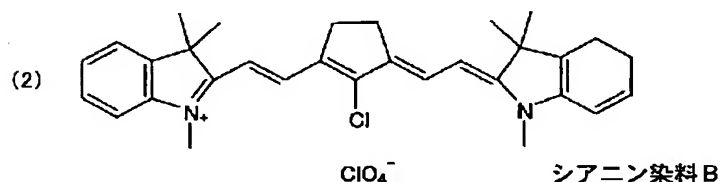
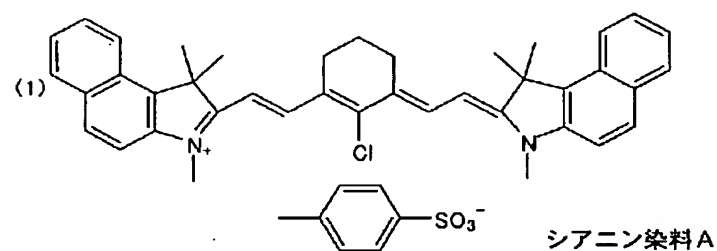
[0226] The inside of said general formula (I), and Y1 And Y2 A dialkyl methylene group or a sulfur atom is shown independently, respectively. As an alkyl group in a dialkyl methylene group, an about one to 12 carbon atomic number thing is desirable, and even if two alkyl groups are the same, they may differ. R3 And R4 The alkyl group of the carbon atomic numbers 1-12, the alkenyl radical of the carbon atomic numbers 1-12, the alkynyl group of the carbon atomic numbers 1-12, or a phenyl group is shown independently, respectively. When these radicals have a substituent, as the substituent, a halogen atom, a carbonyl group, a nitro group, a nitrile group, a sulfonyl group, a carboxyl group, carboxylate, a sulfonate, etc. are mentioned. L2 The trimethine group, pentamethine radical, or hepta-methine group which may have the substituent is shown, and a pentamethine radical or two substituents on a hepta-methine group may connect mutually, and may form the cycloalkene ring of carbon numbers 5-7. Here, it is L2. When it has a substituent, as a substituent, the alkyl group of a halogen atom and the carbon atomic numbers 1-8 etc. is mentioned. R5 -R8 The alkyl group of carbon numbers 1-12 which may have the hydrogen atom or the substituent, an alkenyl radical, an alkoxy group, a cycloalkyl radical, and an aryl group are shown independently, respectively. R5 R6 and R7 R8 It may join together, respectively and the ring structure may be formed. R5 -R8 If it carries out, specifically, a hydrogen atom, a methyl group, an ethyl group, a phenyl group, the dodecyl, a naphthyl group, a vinyl group, an allyl group, a cyclohexyl radical, etc. are mentioned. Moreover, when these radicals have a substituent, as the substituent, a halogen atom, a carbonyl group, a nitro group, a nitrile group, a sulfonyl group, a carboxy group, carboxylate, a sulfonate, etc. are mentioned.

[0227] X - An anion is shown. In addition, R3 -R8 It is X when it has an anionic substituent upwards. It is not necessary to exist. -

[0228] Although the example of cyanine dye expressed with a general formula (I) below is shown, this invention is not restricted to this.

[0229]

[Formula 24]



[0230] As for said cyanine dye, it is desirable that it is one to 20 mass % among the total solids of the constituent which constitutes a sensitization layer. Moreover, in a sensitization layer, unless the effectiveness of this invention is spoiled, the well-known light-and-heat conversion agent mentioned later can also be used together.

[0231] The solvent system used next in case a sensitization layer is formed is explained. Among a coating liquid solvent, the boiling point which the boiling point occupies in a less than 200-degree C solvent requires that the rate of a less than 100-degree C solvent is more than 80 mass %, it is desirable that it is more than 90 mass %, and it is more desirable that all the coating liquid solvents are solvents of less than 100 degrees C of boiling points.

[0232] Although the following are illustrated as a solvent of less than 100 degrees C of boiling points used for sensitization layer coating liquid, this invention is not limited to these. In addition, the typical boiling point (degree C) is indicated in the parenthesis after a solvent name.

a methanol (65.0) -- ethanol (78.5) -- n - propanol (97.3) -- isopropanol (82.3) -- etc. -- alcohols --; -- a tetrahydrofuran -- (--- 66 ---) -- dioxolane -- (--- 74 ---) -- methyl dioxolane -- (--- 81 ---) -- etc. -- ether --; -- an acetone -- (--- 56 ---) -- METERU -- ethyl -- a ketone (79.6) -- etc. -- a ketone -- a kind --; -- ethyl acetate -- (--- 77 ---) -- isopropyl acetate (88.7) -- etc. -- ester -- a kind --; -- n -- a hexane (68.7) -- a cyclohexane (80.7) -- n --

a heptane (98.4) -- etc. etc. -- a hydrocarbon -- a kind . Especially, a methanol, ethanol, a methyl ethyl ketone, ethyl acetate, etc. are desirable.

[0233] Moreover, in the solvent system used for this invention, if it is the specified quantity even if the boiling point is a thing 100 degrees C or more, it can use suitably by using it, mixing with the solvent of less than 100 degrees C of boiling points. As a solvent 100 degrees C or more, the following [boiling point / which can be used together with the solvent of less than 100 degrees C of said boiling points] are illustrated, for example.

n-butanol (117.7), isobutanol (108.3), 2-methyl-2-butanol (101.8), 2-ethyl-2-butanol (147), 2, a 4-dimethyl-3-pentanol (140), n-hexanol (160), a cyclohexanol (161.1), Alcohols, such as 1-octanol (195.2); A 3-methoxy-3-methyl butanol (174), 1-methoxy-2-propanol (120.6), dipropylene glycol monomethyl ether (190), Tripropylene glycol monomethyl ether (243), the propylene glycol monobutyl ether (170.2), Propylene glycol monomethyl acetate (146), methyl carbitol (193.6), Ether, such as ethyl carbitol (202.8); Methyl propyl ketone (102), Methyl isobutyl ketone (115.1), a METERU amyl ketone (151), A diethyl ketone (102.8), 3-hydroxy-2-butanone (148), 4-hydroxy-2-butanone (182), cyclopentanone (129), Ketones, such as a cyclohexanone (155.4) and diacetone alcohol (169.2); Methyl lactate (144.8), Ethyl lactate (157), butyl lactate (188), n-propyl acetate (102), N-butyl acetate (126.6), methyl butyrate (102.3), ethyl butylate (120), Hydrocarbons; water, such as ester; n-octane (125.7), such as butyl butyrate (166.4) and gamma-butyrolactone (206), toluene (110.6), and a xylene (139) (100); dimethyl diethylene glycol (162).

[0234] These solvents are independent, or two or more sorts are mixed and they are used. Although choose in consideration of the solubility of the component used for a photosensitive constituent, dispersibility, etc., it is made to make dissolve or distribute by the suitable concentration for a suitable solvent and sensitization layer coating liquid is adjusted, whether which solvent is used needs to adjust at this time so that the rate that a less than 100-degree C solvent occupies among a solvent system may not become under 80 mass %. Although especially coating liquid concentration is not limited, it is common that solid content concentration is two to 50 mass %.

[0235] Although sensitization layer coating liquid is applied and dried by the base material and a sensitization layer is formed, there is especially no limit in the approach of applying sensitization layer coating liquid on a base material, and conventionally, a well-known approach can be chosen suitably and can be enforced. For example, rotation spreading, wire bar spreading, DIP spreading, the Ayr knife spreading, roll coating, blade spreading, and curtain spreading are mentioned.

[0236] As for the coverage of a sensitization layer, choosing suitably according to an application is mainly desirable in order to affect the reinforcement and print durability of the sensibility of a sensitization layer, development nature, and the exposure film. Print durability becomes less enough when there is too little coverage (the amount of covering). When there is too much coverage, in sensibility's falling and exposure taking time amount on the other hand, it is not desirable in order for a development to also take longer time amount. this invention -- setting -- the amount of after [desiccation] covering -- 0.1 - 7 g/cm² it is -- a thing -- desirable -- 0.2 - 5 g/cm² it is -- a thing -- more -- desirable -- 0.5 - 3 g/cm² it is -- a thing is still more desirable.

[0237] It is desirable that it is [60 degrees-C or more] less than 250 degrees C, as for the drying temperature after sensitization layer spreading, it is more desirable that it is [80 degrees-C or more] less than 200 degrees C, and it is still more desirable that it is [90 degrees-C or more] less than 180 degrees C. Moreover, it is desirable that it is less than 5 minutes 20 seconds or more, as for the drying time, it is more desirable that it is less than 4 minutes 25 seconds or more, and it is still more desirable that it is less than 3 minutes 30 seconds or more. When spreading temperature is less than 60 degrees C or the drying time is less than 20 seconds, there is a possibility that a residual solvent may remain in large quantities and sensibility may fall. Moreover, if spreading temperature is 250 degrees C or more or the drying time is 5 minutes or more, the reduction effectiveness of a residual solvent will not improve considering energy expenditure. Especially in this invention, since the component which is easy to deteriorate with heating is not contained, if it is heating to the upper limit of a well-known

drying temperature or the drying time, there will usually be especially no problem.

[0238] In this invention, it is desirable that the boiling point which the boiling point in the residual solvent contained in this formed sensitization layer occupies in a less than 200-degree C solvent is [the percentage of a less than 100-degree C solvent] 50% or more, and it is more desirable that it is 70% or more. As a measuring method of the amount of a residual solvent, although the viewpoint of the accuracy of measurement to gas chromatography is desirable, it is relation with other components contained in a sensitization layer, and only a less than 220-degree C thing is correctly detected for the boiling point among a solvent. However, since there is usually almost nothing, in this invention, the boiling point which the boiling point in a residual solvent occupies in a less than 200-degree C solvent measures the rate of a less than 100-degree C solvent, and makes it a standard to use the high boiler of 220 degrees C or more of boiling points, so that clearly also from instantiation of said spreading solvent. The inclination for the rate of a less than 100-degree C solvent to be inferior to development nature in it when the boiling point in a residual solvent uses an aluminum base material especially with large thickness under the effect of the high-boiling point solvent which remained that it was less than 50% is seen here, and it is not desirable.

[0239] The resin of the water-insoluble nature used for the image recording layer A-3 and alkali fusibility, its addition, etc. are the same as that of explanation of "(A) alkali fusibility high molecular compound" used for the image recording layer A-1 mentioned above.

[0240] Although the image recording layer A-3 contains said cyanine dye, it can also contain the compound (light-and-heat conversion agent) which absorbs other light and generates heat in a sensitization layer from a viewpoint of the improvement in sensibility to exposure. The compound which absorbs other light and generates heat, its addition, etc. are the same as that of explanation of "(C) Compound which absorbs light and generates heat" used for the image recording layer A-1 mentioned above.

[0241] In the image recording layer A-3, various additives can be added further if needed. As such an additive, an onium salt, an aromatic series sulfone compound, an aromatic series sulfonate compound, and a polyfunctional amine compound are mentioned. The explanation about these is the same as the explanation given in "component [of < and others] >" of the image recording layer A-2. If these are added, since the lysis inhibition function to the developer of an alkali water-soluble macromolecule can be raised, it is desirable.

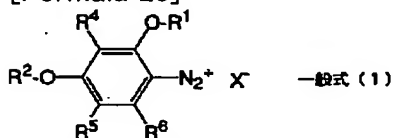
[0242] Furthermore, cyclic anhydrides, phenols, and organic acids can also be used together in order to raise sensibility. Cyclic anhydrides, phenols, organic acids, those additions, etc. are the same as that of explanation of "(D) Other components" used for the image recording layer A-1 mentioned above.

[0243] Moreover, in the image recording layer A-3, since the stability of the processing to development conditions is extended, an amphoteric surface active agent which is indicated by a nonionic surface active agent which is indicated by JP,62-251740,A and JP,3-208514,A, JP,59-121044,A, and JP,4-13149,A can be added. What was enumerated of "(D) Other components" used for the image recording layer A-1 mentioned above as an example of a nonionic surface active agent and an amphoteric surface active agent, and the same thing are mentioned.

[0244] In the image recording layer A-3, the surfactant for improving spreading nature, for example, a fluorochemical surfactant which is indicated by JP,62-170950,A, can be added. a desirable addition -- 0.01 to 1 mass [of all the charges of a printing plate] % -- it is 0.05 to 0.5 mass % still more preferably.

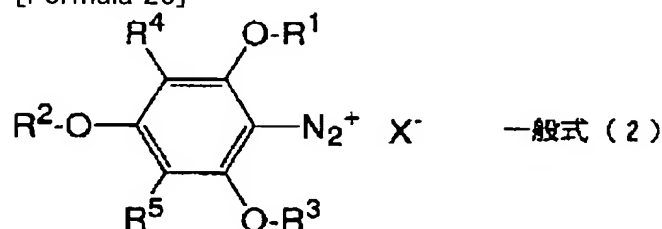
[0245] The color and pigment as the baked appearance electuarium and the image coloring agent for obtaining a visible image immediately after heating by exposure can be added to the image recording layer A-3. baked appearance electuarium and an image coloring agent -- the addition of them etc. is the same as that of explanation of "(D) other components" used for the image recording layer A-1 mentioned above.

[0246] If needed, in order to give the flexibility of a paint film etc., a plasticizer is added to the image recording layer A-3. What was enumerated of "(D) Other components" used for the image recording layer A-1 mentioned above as an example of a plasticizer, and the same thing are mentioned.



[0256]

[Formula 26]



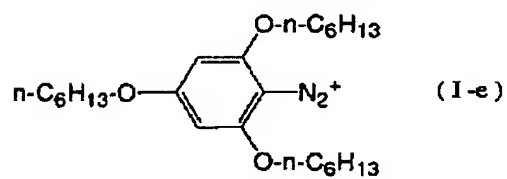
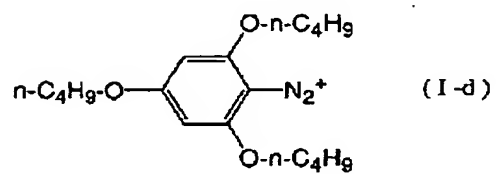
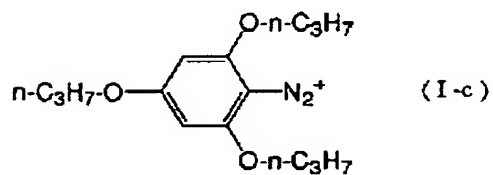
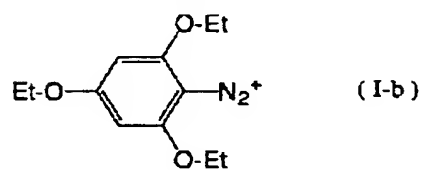
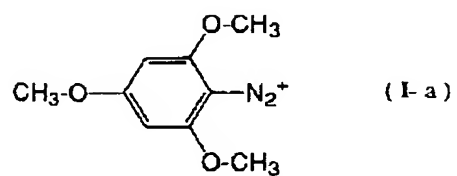
[0257] The inside of a formula, R1, and R2 And R3 The straight chain of carbon numbers 1-12, branching or an alicyclic alkyl group, the ring of carbon numbers 6-10, or the aralkyl radical of carbon numbers 7-12 is shown independently, respectively. R4 And R5 An alkyl group a hydrogen atom or the straight chain of carbon numbers 1-10, branching, or alicyclic is expressed independently, respectively. X - The counter anion chosen from the group which consists of F-, Cl-, Br-, I-, ClO4-, BF4-, PF6-, SbF6-, AsF6-, alkyl sulfonic-acid ion, and aryl sulfonic-acid ion is expressed. It sets to a general formula (2) and is R1 and R2. And R3 As an example of a hydrocarbon group expressed A methyl group, an ethyl group, n-propyl group, i-propyl group, an allyl group, n-butyl, sec-butyl, t-butyl, a hexyl group, a cyclohexyl radical, Alkyl groups, such as an octyl radical, a 2-ethylhexyl radical, and dodecyl; A vinyl group, Alkenyl radicals, such as 1-methylvinyl radical and 2-phenyl vinyl group; Benzyl, Aralkyl radicals, such as a phenethyl radical; aryl groups, such as a phenyl group, a tolyl group, a xylyl group, a KUMENIRU radical, a mesityl radical, a dodecyl phenyl group, a phenyl phenyl group, a naphthyl group, and an anthracenyl group, are mentioned.

[0258] These hydrocarbon groups may have substituents, such as a halogen atom, a hydroxy group, an alkoxy group, an allyloxy radical, a nitro group, a cyano group, a carbonyl group, a carboxyl group, an alkoxy carbonyl group, an ANIRINO radical, and an acetamide radical. As an example of a hydrocarbon group of having a substituent A trifluoromethyl radical, 2-methoxy ethyl group, 10-camphor nil radical, A fluoro phenyl group, a chlorophenyl radical, a BUROMO phenyl group, an iodine phenyl group, A methoxyphenyl radical, a hydroxyphenyl radical, a phenoxyphenyl radical, A nitrophenyl group, a cyanophenyl radical, a carboxyphenyl radical, an ANIRINO phenyl group, An ANIRINO carbonyl phenyl group, a morpholino phenyl group, a phenylazo phenyl group, a methoxy naphthyl group, a hydroxy naphthyl group, a nitro naphthyl group, a dimethoxy anthracenyl group, a diethoxy anthracenyl radical, and an anthraquinonyl radical are mentioned. Moreover, R4 And R5 When it expresses a hydrocarbon group, it is the above R1 and R2. And R3 The hydrocarbon group expressed and the same substituent can be mentioned.

[0259] Although the diazonium ion specifically shown with the following structure is mentioned as the cation section of diazonium salt expressed with a general formula (1) and the general formula (2) which is the desirable mode further, this invention is not limited to these. In addition, the example of diazonium salt expressed with the general formula (2) which is a desirable mode among the following structures attaches and shows the sign of I.

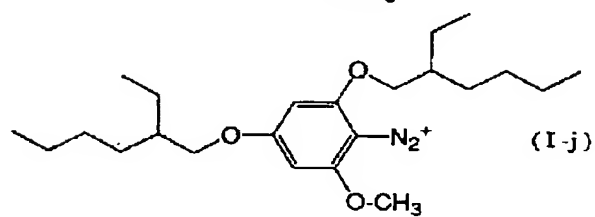
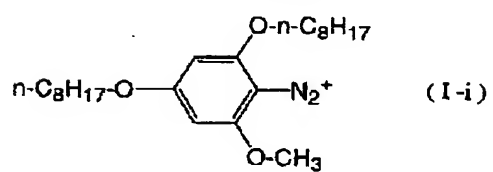
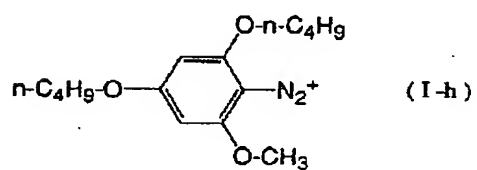
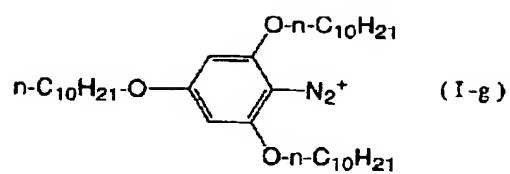
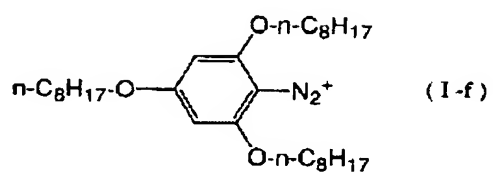
[0260]

[Formula 27]



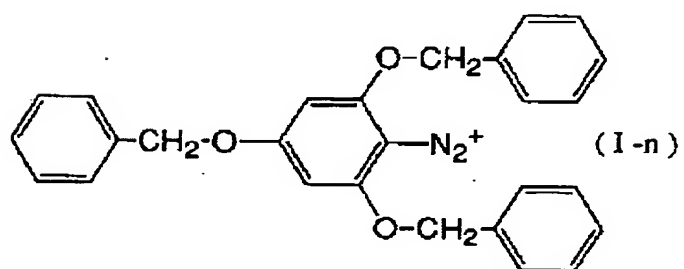
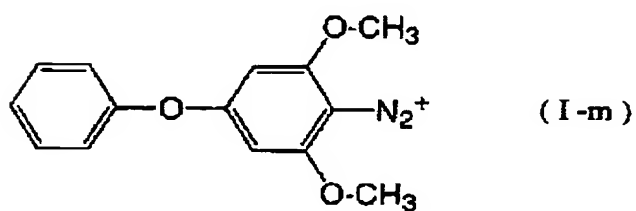
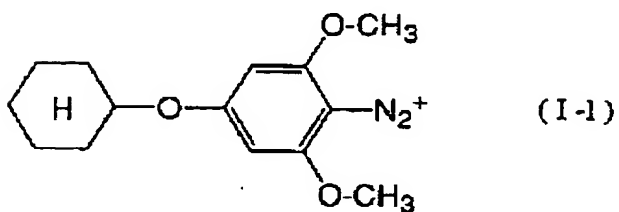
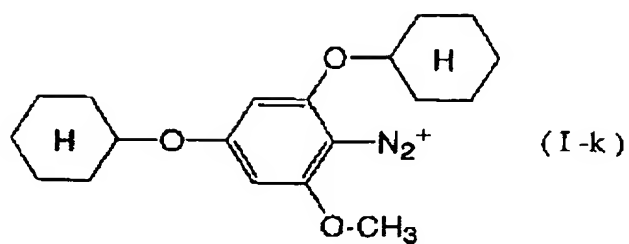
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[Formula 28]



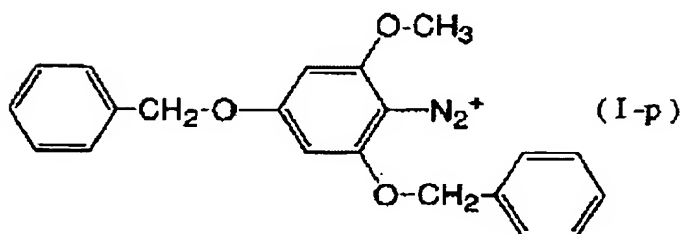
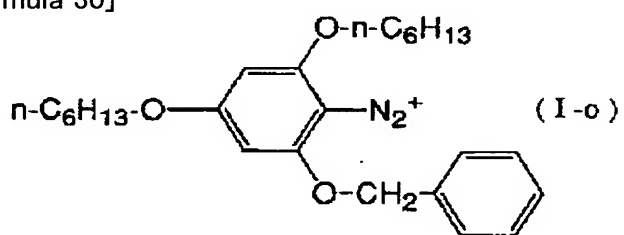
[0262]

[Formula 29]



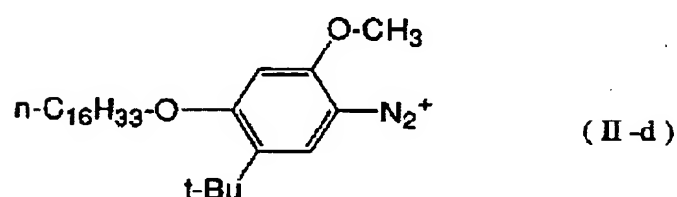
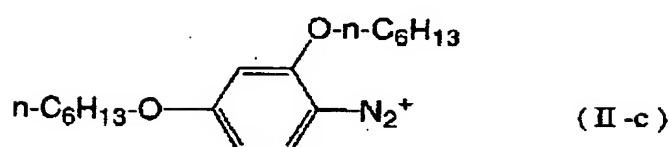
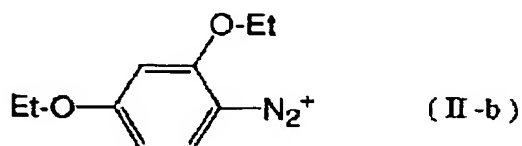
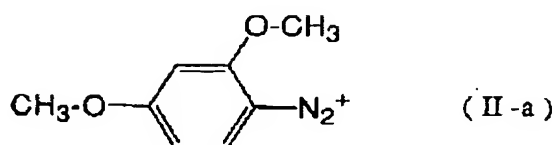
[0263]

[Formula 30]



[0264]

[Formula 31]



[0265] as the anion used good as a counter anion of such diazonium salt on the other hand -- 1F and 2 -- Cl, 3Br, 4I, 5ClO₄, 6BF₄, 7 PF₆, 8SbF₆, and 9AsF₆ etc. -- inorganic ion; -- sulfonic-acid ion, such as alkyl sulfonic-acid ion and aryl sulfonic-acid ion, is mentioned. As desirable sulfonic-acid ion, 11 methanesulfonate, 12 ethane sulfonate, 13) 1-propanesulfonate, 142-propanesulfonate, 15) n-butane sulfonate, 16 allyl-compound sulfonate, 17 10-camphor sulfonate, 18) Trifluoromethane sulfonate, 19 pentafluoro ethane sulfonate, 20) Benzene sulfonate, 21 p-toluene sulfonate, 223-methoxybenzene sulfonate, 23) 4-methoxybenzene sulfonate, 244-hydroxybenzene sulfonate, 25) 4-chlorobenzene sulfonate, 263-nitrobenzene sulfonate, 27) 4-nitrobenzene sulfonate, 284-acetyl benzene sulfonate, 29 pentafluoro benzene sulfonate, 304-dodecylbenzene sulfonate, [0266] 31) mesitylene sulfonate and 32 -- 2, 4, and 6-triisopropyl benzene sulfonate -- 33) 2-hydroxy-4-methoxybenzophenone-5-sulfonate, 34) Isophthalic acid dimethyl-5-sulfonate, 35 diphenylamine-4-sulfonate, 36) 1-naphthalene sulfonate, 372-naphthalene sulfonate, 38) 2-naphthol-6-sulfonate, 39 2-naphthol-7-sulfonate, 40) Anthraquinone-1-sulfonate, 41 anthraquinone-2-sulfonate, 42) 9, 10-dimethoxyanthracene-2-sulfonate, 439, 10-diethoxy anthracene-2-sulfonate, 44) Quinoline-8-sulfonate, 45 8-hydroxyquinoline-5-sulfonate, 468-anilinonaphthalene-1-sulfonate, etc. are mentioned.

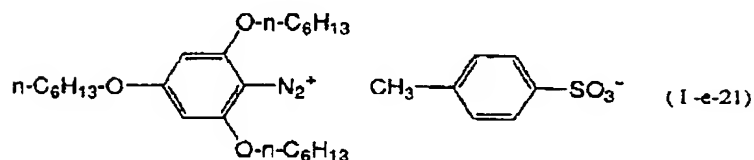
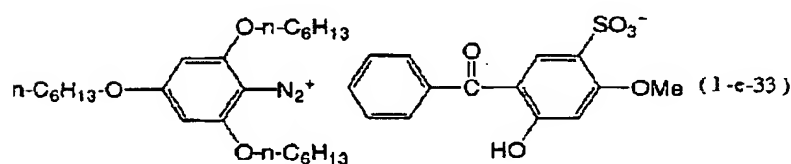
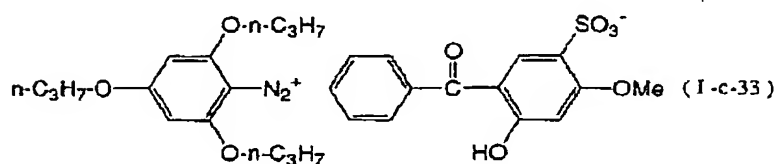
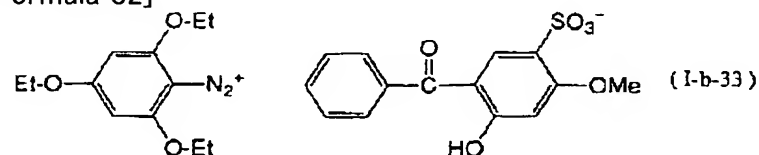
[0267] Moreover, 51m-benzene disulfo NETO illustrated below, 52 benzaldehydes -2, 4-disulfo NETO, 53) 1, 5-North America Free Trade Agreement range sulfonate, 542, 6-North America Free Trade Agreement range sulfonate, 55) 2, 7-North America Free Trade Agreement range sulfonate, 56 anthraquinone -1, 5-disulfo NETO, 57) Anthraquinone -1, 8-disulfo NETO, 58 anthraquinone -2, 6-disulfo NETO, 59) Disulfo NETO, such as 9, 10-dimethoxyanthracene -2, 6-disulfo NETO, 609, 10-diethoxy anthracene -2, 6-disulfo NETO, and 61 dodecyl diphenyl ether disulfo NETO A 2Eq [of diazonium salt cations] salt can also be used.

[0268] The example of the above-mentioned diazonium salt used for this invention is shown below. In addition, a front, the number shown after each example of a compound shows the sign given to what the second term (Roman numerals and the small letter of the alphabet, for

example, "I-b") mentioned as a desirable example of the cation section of the above-mentioned diazonium salt, and although the last term (Arabic numerals, for example, "33") mentioned as a desirable example of the above-mentioned counter anion, it shows a number.

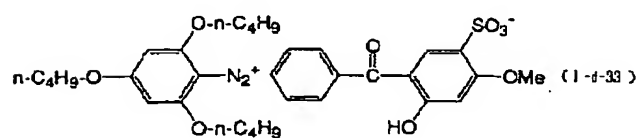
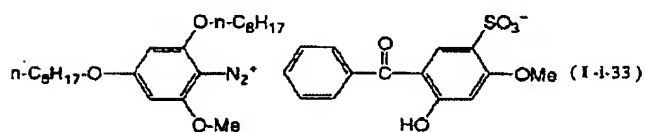
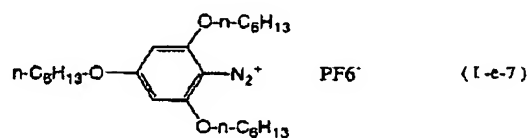
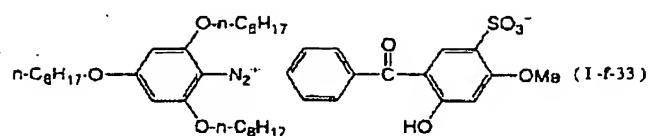
[0269]

[Formula 32]



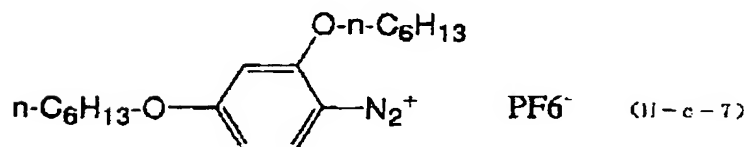
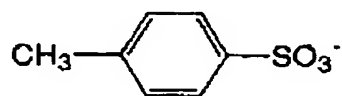
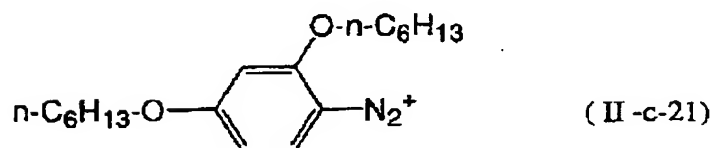
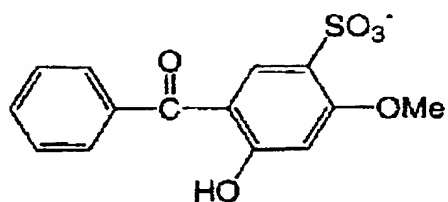
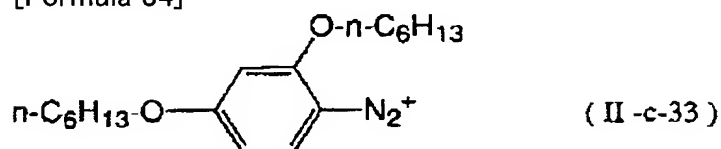
[0270]

[Formula 33]



[0271]

[Formula 34]



[0272] The infrared absorption agent (compound which absorbs light and generates heat) used for the image recording layer B-1, its addition, etc. are the same as that of explanation of "(C) Compound which absorbs light and generates heat" used for the image recording layer A-1 mentioned above.

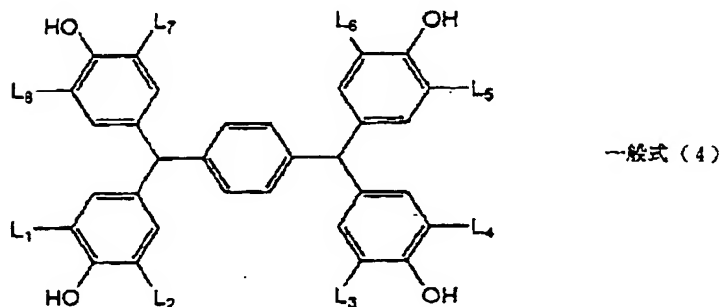
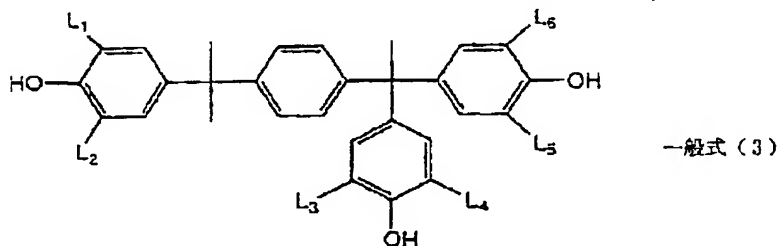
[0273] The compound and epoxy compound (iii) which have the aromatic compound permuted by (i) alkoxy methyl group or the hydroxymethyl group, a (ii) N-hydroxymethyl group, an N-alkoxy methyl group, or N-acyloxy methyl group, for example as a cross linking agent (less or equal "an acid cross linking agent" or it is also only called a "cross linking agent".) which constructs a bridge with the acid used for the image recording layer B-1 are mentioned. Hereafter, these are explained to a detail.

[0274] (i) As an aromatic compound permuted by the alkoxy methyl group or the hydroxymethyl group, the aromatic compound and heterocyclic compound by which the Pori permutation is carried out by the hydroxymethyl group, the acetoxy methyl group, or the alkoxy methyl group are mentioned, for example. However, the compound of the shape of resin to which the polycondensation of the phenols known as resol resin and the aldehydes was carried out under basic conditions is not included. Although excelled in cross-linking, resol resin does not have enough thermal stability, and since uniform development becomes difficult especially when a photosensitive ingredient is made to contain and it saves under an elevated temperature for a long period of time, it is not desirable.

[0275] In the aromatic compound by which the Pori permutation was carried out by the hydroxymethyl group or the alkoxy methyl group, and a heterocyclic compound, the compound which has a hydroxymethyl group or an alkoxy methyl group in the location which adjoins a hydroxy group is illustrated suitably. When using an alkoxy methyl group, it is desirable that an alkoxy methyl group is a with a carbon number of 18 or less compound. The compound especially expressed with following general formula (3) - (6) as a desirable example can be mentioned.

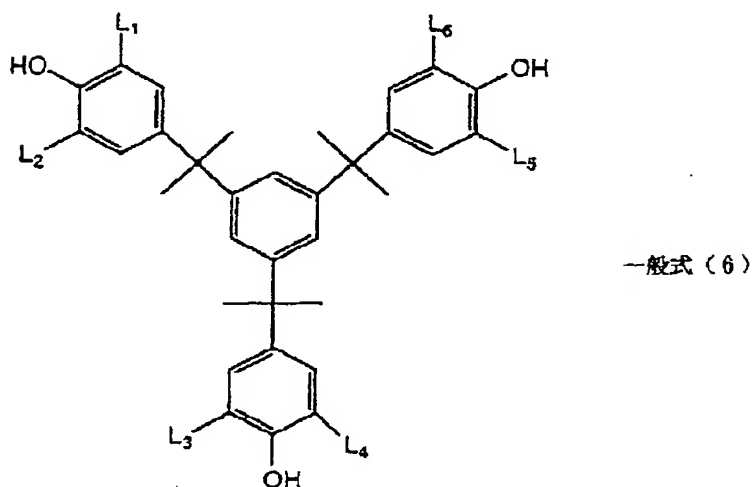
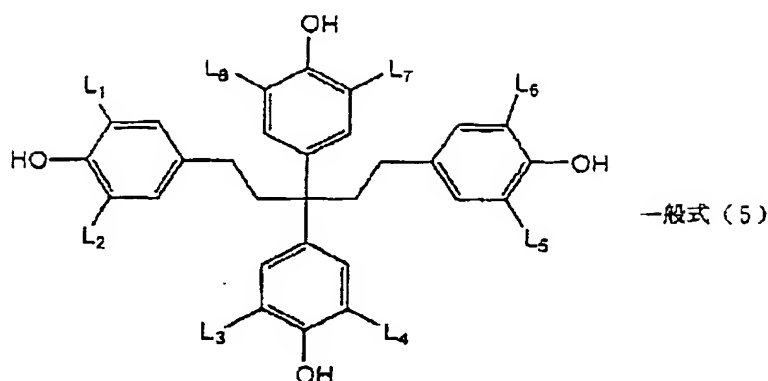
[0276]

[Formula 35]



[0277]

[Formula 36]



[0278] The inside of said each formula, and L1 -L8 The hydroxymethyl group or alkoxy methyl group permuted independently by the with a carbon number of 18 or less alkoxy group like the methoxymethyl radical and the ethoxy methyl group, respectively is shown. These have high bridge formation effectiveness and it is desirable at the point which can raise print durability. The cross-linking compound illustrated above may be used independently, and may be used combining two or more sorts.

[0279] (ii) As a compound which has N-hydroxymethyl group, an N-alkoxy methyl group, or N-acyloxy methyl group, the monomer indicated by the Europe patent public presentation (it is hereafter indicated as EP-A) No. 0,133,216, the West German patent No. 3,634,671 specification, and the 3,711,264 specification, an oligomer-melamine-formaldehyde condensate and a urea-formaldehyde condensate, the alkoxy substituted compound indicated by EP-A No. 0,212,482 are mentioned. Furthermore, as a desirable example, the melamine-formaldehyde derivative which has at least two isolation N-hydroxymethyl groups, an N-alkoxy methyl group, or N-acyloxy methyl group is mentioned. Especially, especially an N-alkoxy methyl derivative is desirable.

[0280] (iii) As an epoxy compound, the epoxy compound of the shape of the monomer and dimer containing one or more epoxy groups, oligomer, or a polymer can be mentioned. For example, the resultant of bisphenol A and epichlorohydrin and the resultant of low-molecular-weight phenol-formaldehyde resin and epichlorohydrin are mentioned. In addition, the epoxy resin which is indicated by a U.S. Pat. No. 4,026,705 specification and the British patent No. 1,539,192 specification, and is used for them can be mentioned.

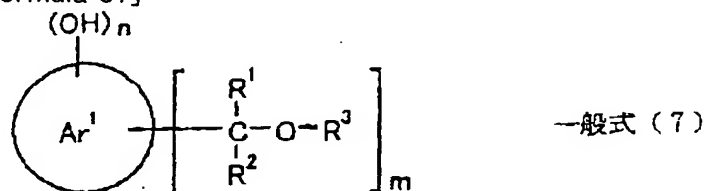
[0281] the cross linking agent which can be used for the above this invention of (i) - (iii) -- image recording ingredient total solids -- receiving -- 5 - 80 mass % -- desirable -- 10 - 75 mass % -- it is especially added in the range of 20 - 70 mass % preferably. The endurance of the sensitization layer of the image recording ingredient obtained as the addition of a cross linking agent is under 5 mass % may get worse. Moreover, if 80 mass % is exceeded, it is not desirable from a viewpoint of the stability at the time of preservation.

[0282] It is also desirable to use the phenol derivative expressed with the (iv) following general

formula (7) as a cross linking agent in this invention.

[0283]

[Formula 37]

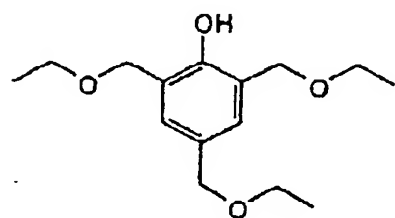


[0284] The inside of the above-mentioned formula, and Ar¹ The aromatic hydrocarbon ring which may have the substituent is shown. As for the ease of acquisition of a raw material to an aromatic hydrocarbon ring, it is desirable that they are the benzene ring, a naphthalene ring, or an anthracene ring. Moreover, as a desirable substituent, a halogen atom, the hydrocarbon group of 12 or less carbon numbers, the alkoxy group of 12 or less carbon numbers, the alkylthio group of 12 or less carbon numbers, a cyano group, a nitro group, and a trifluoromethyl radical are mentioned, for example. the reason sensibility is high -- Ar¹ ***** -- especially the benzene ring or the naphthalene ring that has as a substituent the benzene ring or the naphthalene ring which does not have the substituent, a halogen atom, the hydrocarbon group of six or less carbon numbers, the alkoxy group of six or less carbon numbers, the alkylthio group of six or less carbon numbers, a nitro group, etc. is desirable. R¹ And R² You may differ, even if respectively the same, and a hydrogen atom or the hydrocarbon group of 12 or less carbon numbers is shown. R¹ since it says that composition is easy And R² It is desirable that they are especially a hydrogen atom or a methyl group. R³ A hydrogen atom or the hydrocarbon group of 12 or less carbon numbers is shown. At the reason sensibility is high, it is R³. It is desirable that it is especially the hydrocarbon group of seven or less carbon numbers, such as a methyl group, an ethyl group, a propyl group, a cyclohexyl radical, and benzyl. m shows the integer of 2-4. n shows the integer of 1-3.

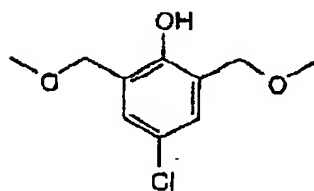
[0285] Although the example (cross linking agent [KZ-1] - [KZ-8]) of a phenol derivative expressed with the above-mentioned general formula (7) suitably used in this invention is shown below, this invention is not limited to this.

[0286]

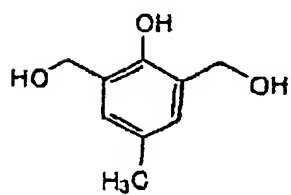
[Formula 38]



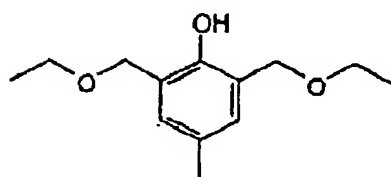
[KZ-1]



[KZ-2]



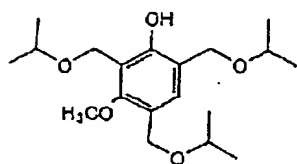
[KZ-3]



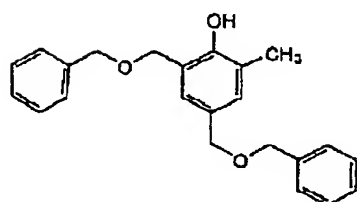
[KZ-4]

[0287]

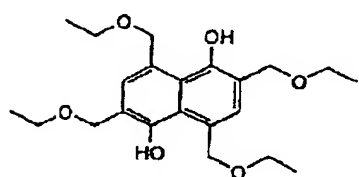
[Formula 39]



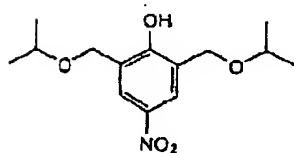
[KZ-5]



[KZ-6]



[KZ-7]



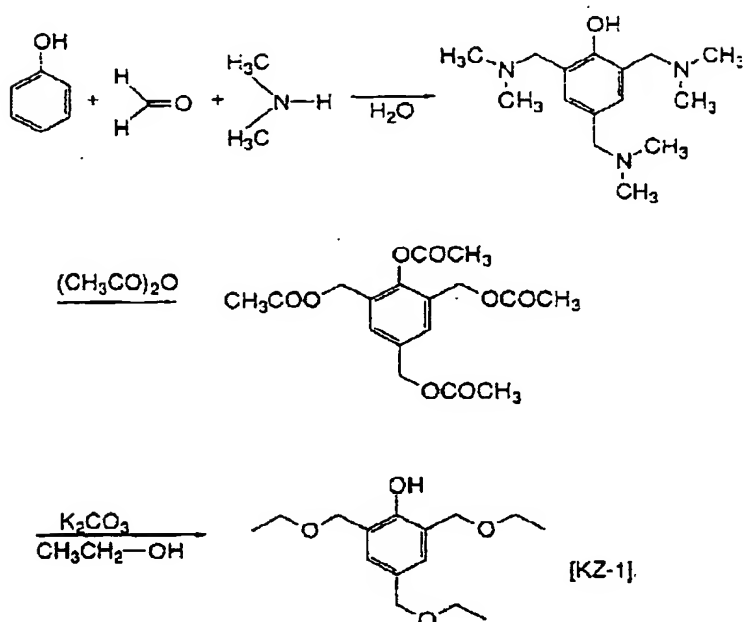
[KZ-8]

[0288] These phenol derivatives are conventionally compoundable by the well-known approach. For example, [KZ-1] is compoundable in the path expressed to the following reaction formula [1] by making a phenol, formaldehyde, and secondary amines, such as dimethylamine and a morpholine, react, considering as the Tori (dialkyl aminomethyl) phenol, making it react with an acetic anhydride next, and making it react with ethanol under weak alkali existence, such as potassium carbonate, further.

[0289] Reaction formula [1]

[0290]

[Formula 40]

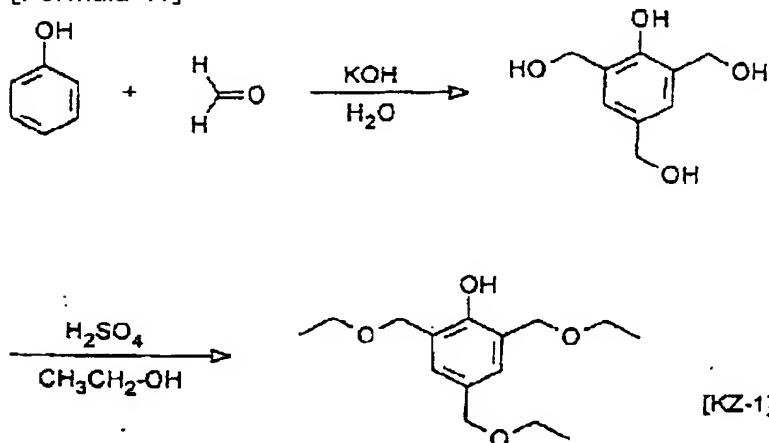


[0291] A phenol derivative is compoundable further with an option. For example, [KZ-1] is compoundable also in the path expressed to the following reaction formula [2] by making it react to the bottom of alkali existence, such as KOH, using a phenol, formaldehyde, or a paraformaldehyde as 2, 4, and 6-trihydroxy methyl phenol, and making it react with ethanol under acid existence, such as a sulfuric acid, succeedingly.

[0292] Reaction formula [2]

[0293]

[Formula 41]



[0294] These phenol derivatives may be used independently and may be used combining two or more kinds. Moreover, although phenol derivatives condense and impurities, such as a dimer and a trimer, may subgenerate in case these phenol derivatives are compounded, you may use, with these impurities contained. In addition, even in this case, as for the amount of an impurity, it is desirable that it is below 30 mass %, and it is more desirable that it is below 20 mass %.

[0295] this invention -- setting -- a phenol derivative -- all the inside of image recording ingredient solid content -- desirable -- five to 70 mass % -- it is more preferably used with the addition of 10 - 50 mass %. If the film reinforcement of the image section at the time of carrying out image recording to the addition of the phenol derivative as a cross linking agent being under 5 mass % here may get worse and 70 mass % is exceeded, it is not desirable in respect of the stability at the time of preservation.

[0296] As a binder used for the image recording layer B-1, novolak resin and the polymer which has a hydroxy aryl group in a side chain are mentioned, for example. The novolak resin which can

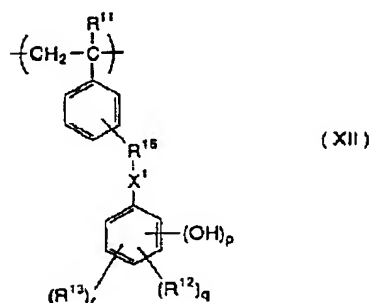
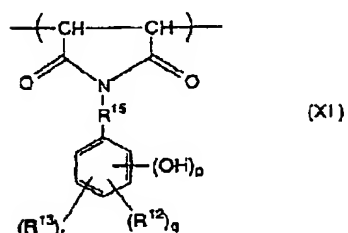
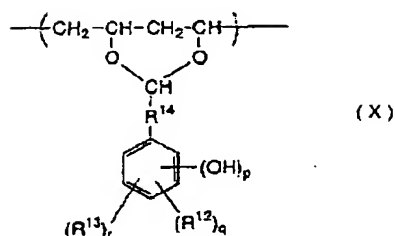
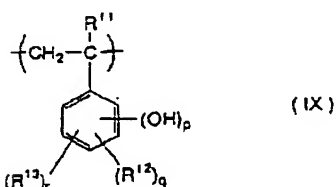
be used as a binder in this invention is resin to which condensation of phenols and the aldehydes was carried out under acid conditions. The novolak resin obtained from a phenol and formaldehyde as desirable novolak resin, for example, The novolak resin obtained from m-cresol and formaldehyde, The novolak resin obtained from p-cresol and formaldehyde, The novolak resin obtained from o-cresol and formaldehyde, The novolak resin obtained from octyl phenol and formaldehyde, The novolak resin obtained from m-/p-mixing cresol and formaldehyde, The novolak resin obtained from the mixture and formaldehyde of a phenol/cresol (any of m-, p-, o-, and m-/p-mixing, m-/o-mixing, and o-/p-mixing are sufficient) is mentioned. Weight average molecular weight is 800-200,000, and the thing of 400-60,000 has [these novolak resin] desirable number average molecular weight.

[0297] Moreover, as a binder, the polymer which has a hydroxy aryl group in a side chain is also illustrated suitably. In this polymer, a hydroxy aryl group means the aryl group which one or more - OH radicals combined. As an aryl group, although a phenyl group, a naphthyl group, an anthracenyl group, and a phenan TORENIRU radical can be mentioned for example, the phenyl group from the ease of acquisition and a viewpoint of physical properties and a naphthyl group are desirable. Therefore, as a hydroxy aryl group, a hydroxyphenyl radical, a dihydroxy phenyl group, a trihydroxy phenyl group, a tetra-hydroxyphenyl radical, a hydroxy naphthyl group, and a dihydroxy naphthyl group are illustrated suitably. These hydroxy aryl groups may have substituents, such as a halogen atom, a hydrocarbon group of 20 or less carbon numbers, an alkoxy group of 20 or less carbon numbers, and an aryloxy group of 20 or less carbon numbers, further. These hydroxy aryl groups may have the connection radical between principal chains, although it has joined together to the polymer principal chain in the shape of a pendant as a side chain of a polymer.

[0298] The polymer which is suitably used in this invention and which has a hydroxy aryl group in a side chain is a polymer containing any one sort in the configuration unit expressed by the following general formula (IX) - (XII).

[0299]

[Formula 42]

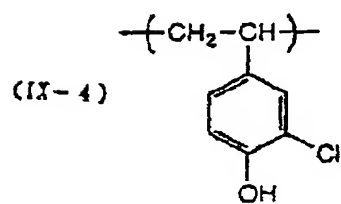
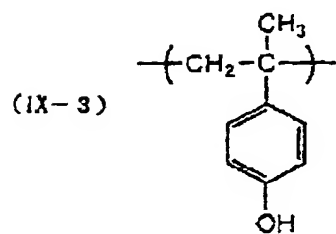
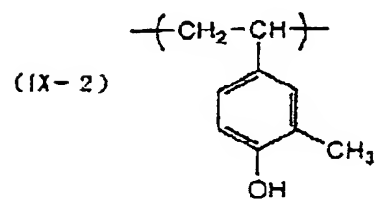
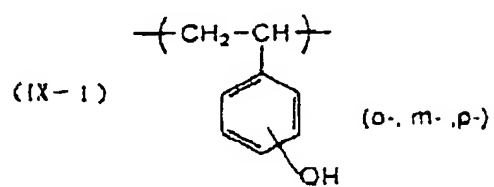


[0300] R11 shows a hydrogen atom or a methyl group among a formula. R12 and R13 show independently a hydrogen atom, a halogen atom, the hydrocarbon group of ten or less carbon numbers, the alkoxy group of ten or less carbon numbers, or the aryloxy group of ten or less carbon numbers, respectively. R12 and R13 may form the benzene ring and the cyclohexane ring which joined together and condensed the ring. R14 shows the divalent hydrocarbon group of single bond or 20 or less carbon numbers. R15 shows the divalent hydrocarbon group of single bond or 20 or less carbon numbers. R16 shows the divalent hydrocarbon group of single bond or ten or less carbon numbers. X1 **, single bond, ether linkage, thioether association, an ester bond, or amide association is shown. p shows the integer of 1-4. q and r show the integer of 0-3 independently, respectively.

[0301] The example of the concrete configuration unit suitably used in this invention among the configuration units expressed with a general formula (IX) - (XII) is given to below.

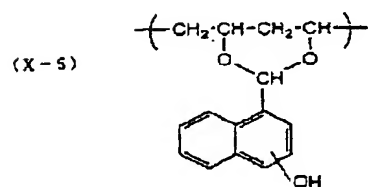
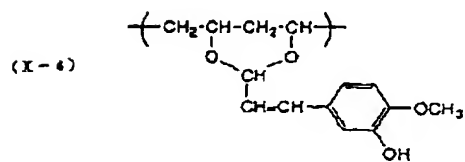
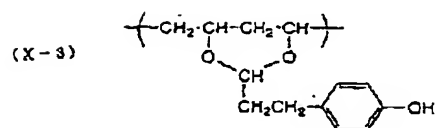
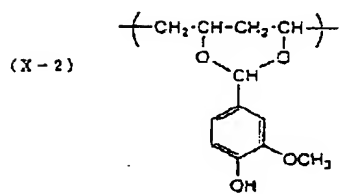
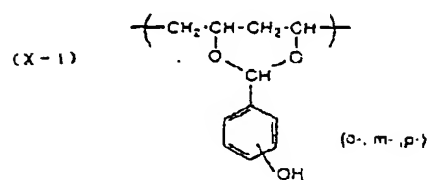
[0302]

[Formula 43]



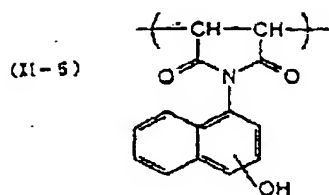
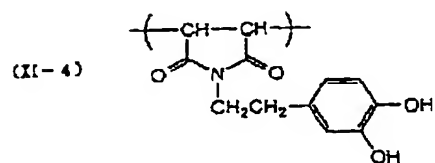
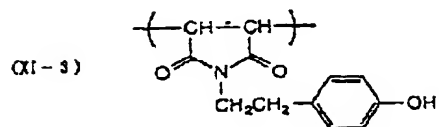
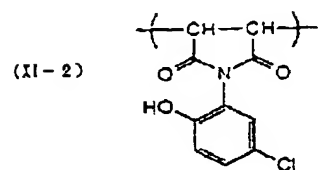
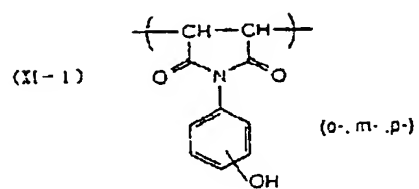
[0303]

[Formula 44]



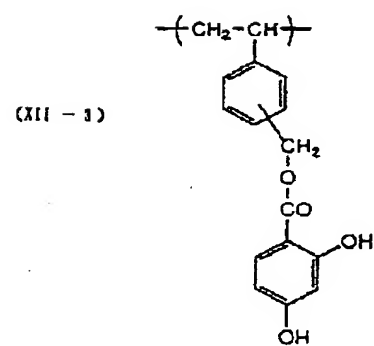
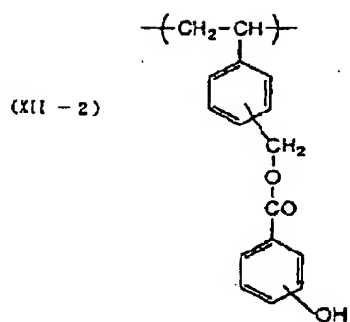
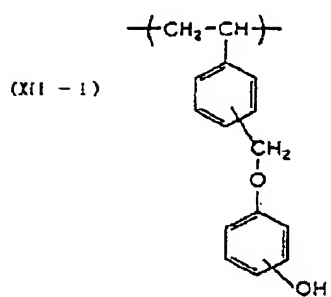
[0304]

[Formula 45]



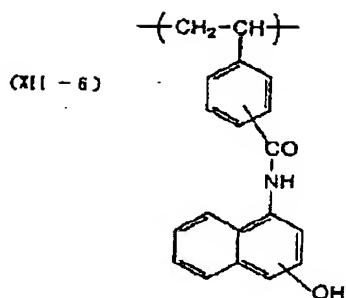
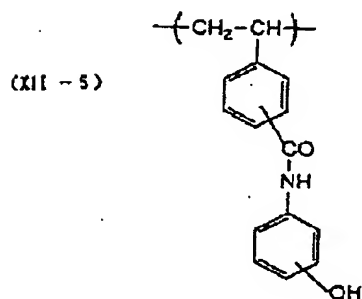
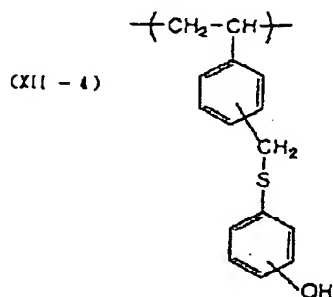
[0305]

[Formula 46]



[0306]

[Formula 47]



[0307] These polymers are conventionally compoundable by the well-known approach. For example, the polymer which has the configuration unit expressed with a general formula (IX) is obtained by carrying out deprotection, after carrying out the radical polymerization of the corresponding styrene derivative protected considering the hydroxy group as acetic ester or *t*-butyl ether, or carrying out anionic polymerization and considering as a polymer. Moreover, the polymer which has the configuration unit expressed with a general formula (X) is compoundable by the approach indicated by JP,64-32256,A, the 64-35436 official report, etc. Furthermore, the polymer which has the configuration unit expressed with a general formula (XI) makes the amine compound and maleic anhydride which have a hydroxy group react, and after obtaining a corresponding monomer, it is obtained by considering as a polymer according to a radical polymerization. Moreover, the polymer which has the configuration unit expressed with a general formula (XII) is guided to the monomer corresponding to a general formula (XII) by using as a raw material the styrene which has a useful functional group on composition of chloro methyl styrene, carboxy styrene, etc., and is obtained by considering as a polymer according to a radical polymerization further.

[0308] Although you may be the homopolymer which consists only of a configuration unit expressed with a general formula (IX) - (XII) in this invention, you may be a copolymer including other configuration units. As other configuration units used suitably, the configuration unit introduced from well-known monomers, such as acrylic ester, methacrylic ester, acrylamides, methacrylamide, vinyl ester, styrene, an acrylic acid, a methacrylic acid, acrylonitrile, a maleic anhydride, and maleic-acid imide, for example is mentioned.

[0309] As an example of acrylic ester, methyl acrylate, ethyl acrylate, Propylacrylate, butyl

acrylate (n-, i-, sec-, or t-), (n- or i-) Amyl acrylate, 2-ethylhexyl acrylate, dodecylacrylate, Chloro ethyl acrylate, 2-hydroxyethyl acrylate, 2-hydroxypropyl acrylate, 5-hydroxy pentyl acrylate, cyclohexyl acrylate, Allyl compound acrylate, trimethylol propane monoacrylate, pentaerythritol monoacrylate, Glycidyl acrylate, benzyl acrylate, methoxybenzyl acrylate, Chloro benzyl acrylate, 2-(p-hydroxyphenyl) ethyl acrylate, furfuryl acrylate, tetrahydrofurfuryl acrylate, phenyl acrylate, chlorophenyl acrylate, and sulfamoyl phenyl acrylate are mentioned.

[0310] As an example of methacrylic ester, methyl methacrylate, Ethyl methacrylate, propyl (n- or i-) methacrylate, Butyl methacrylate, amyl methacrylate, (n-, i-, sec-, or t-) 2-ethylhexyl methacrylate, dodecyl methacrylate, chloro ethyl methacrylate, 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, 5-hydroxy pentyl methacrylate, cyclohexyl methacrylate, Allyl compound methacrylate, trimethylol propane mono-methacrylate, Pentaerythritol mono-methacrylate, glycidyl methacrylate, Methoxybenzyl methacrylate, chloro benzyl methacrylate, 2-(p-hydroxyphenyl) ethyl methacrylate, furfuryl methacrylate, tetrahydrofurfuryl methacrylate, phenyl methacrylate, chlorophenyl methacrylate, and sulfamoyl phenyl methacrylate are mentioned.

[0311] As an example of acrylamides, acrylamide, N-methylacrylamide, N-ethyl acrylamide, N-propyl acrylamide, N-butyl acrylamide, N-benzyl acrylamide, N-hydroxyethyl acrylamide, N-phenyl acrylamide, N-tolyl acrylamide, N-(p-hydroxyphenyl) acrylamide, N-(sulfamoyl phenyl) acrylamide, N-(phenyl sulfonyl) acrylamide, N-(tolyl sulfonyl) acrylamide, N,N-dimethylacrylamide, N-methyl-N-phenyl acrylamide, and N-hydroxyethyl-N-methylacrylamide are mentioned.

[0312] As an example of methacrylamide, methacrylamide, N-methyl methacrylamide, N-ethyl methacrylamide, N-propyl methacrylamide, N-butyl methacrylamide, N-benzyl methacrylamide, N-hydroxyethyl methacrylamide, N-phenyl methacrylamide, N-tolyl methacrylamide, N-(p-hydroxyphenyl) methacrylamide, N-(sulfamoyl phenyl) methacrylamide, N-(phenyl sulfonyl) methacrylamide, N-(tolyl sulfonyl) methacrylamide, N, and N-dimethyl methacrylamide, N-methyl-N-phenyl methacrylamide, and N-hydroxyethyl-N-methyl methacrylamide are mentioned.

[0313] As an example of vinyl ester, vinyl acetate, vinyl butyrate, and vinyl benzoate are mentioned.

[0314] As an example of styrene, styrene, methyl styrene, dimethyl styrene, trimethyl styrene, ethyl styrene, propyl styrene, cyclohexyl styrene, chloro methyl styrene, trifluoro methyl styrene, ethoxy methyl styrene, acetoxy methyl styrene, methoxy styrene, dimethoxy styrene, chloro styrene, dichloro styrene, bromostyrene, iodine styrene, fluoro styrene, and carboxy styrene are mentioned.

[0315] Especially being used suitably are with a carbon number of 20 or less acrylic ester, methacrylic ester, acrylamides, methacrylamide, vinyl ester, and styrene; acrylic-acid; methacrylic-acid; acrylonitrile among these monomers.

[0316] As for the rate of the configuration unit expressed with the general formula (IX) contained in the copolymer using these - (XII), it is desirable that it is 5 - 100 mass %, and it is more desirable that it is 10 - 100 mass %. Moreover, it is desirable that weight average molecular weight is 4000 or more, it is more desirable that it is the range of 10,000-300,000, and as for the molecular weight of the above-mentioned polymer used by this invention, it is desirable that number average molecular weight is 1000 or more, and it is more desirable that it is the range of 2000-250,000. One or more is desirable still more desirable, and the range of polydispersed degree (weight average molecular weight/number average molecular weight) is 1.1-10. Although these polymers may be any, such as a random polymer, block polymer, and a graft polymer, it is desirable that it is a random polymer.

[0317] The binder used by this invention may be used only by one kind, and may be used combining two or more sorts. Among [all] image recording ingredient solid content, it is desirable that it is five to 95 mass %, as for the addition of a binder, it is more desirable that it is ten to 95 mass %, and it is still more desirable that it is 20 to 90 mass %. Image formation may not be carried out, when the endurance of a recording layer may get worse that the addition of a binder is under 5 mass % and an addition exceeds 95 mass %.

[0318] In the image recording layer B-1, various compounds may be added if needed in addition

to these. For example, the color which has big absorption in a light region can be used as an image coloring agent. The example of an image coloring agent, the addition, etc. are the same as that of explanation of "(D) Other components" used for the image recording layer A-1 mentioned above.

[0319] Moreover, in the image recording ingredient in this invention, since the stability of the processing to development conditions is extended, an amphoteric surface active agent which is indicated by a nonionic surface active agent which is indicated by JP,62-251740,A and JP,3-208514,A, JP,59-121044,A, and JP,4-13149,A can be added. The example of a nonionic surface active agent and an amphoteric surface active agent, the addition, etc. are the same as that of explanation of "(D) Other components" used for the image recording layer A-1 mentioned above.

[0320] Furthermore, if needed, in order to give the flexibility of a paint film etc., a plasticizer is added to the image recording layer B-1. What was enumerated of "(D) Other components" used for the image recording layer A-1 mentioned above as an example of a plasticizer, and the same thing are mentioned. Furthermore, an epoxy compound and vinyl ether may be added besides these.

[0321] The image recording ingredient used for this invention can usually melt each above-mentioned component to a solvent, and can manufacture it by applying on a suitable base material. The concentration of the solvent used here and coating liquid etc. is the same as that of explanation of "(D) Other components" used for the image recording layer A-1 mentioned above.

[0322] moreover, the sensible-heat layer coverage on the base material obtained after spreading desiccation (solid content) -- 0.5 - 5.0 g/m² it is -- a thing is desirable.

[0323] As an approach of applying, although various approaches can be used, bar coating-machine spreading, rotation spreading, a spray coating cloth, curtain spreading, DIP spreading, the Ayr knife spreading, blade spreading, and roll coating are mentioned, for example. Although apparent sensibility becomes large as coverage decreases, the coat property of a film falls.

[0324] In the image recording layer B-1, the surfactant for improving spreading nature, for example, a fluorochemical surfactant which is indicated by JP,62-170950,A, can be added. a desirable addition -- 0.01 to 1 mass [of all the charges of a printing plate] % -- it is 0.05 to 0.5 mass % still more preferably.

[0325] The <image recording layer B-2> image recording layer B-2 contains the compound which controls a surface coefficient of friction of rest low. An example is given to below and the one mode is explained to it. In this mode, what contains (A) radical generating agent, (B) radical polymerization nature compound, and the compound expressed with the (D) following general formula (1) as an image recording layer B-2 is used.

[0326] R1-X General formula (1)

(R1 shows among a formula a hydrocarbon group with 8-32 total carbon which may have the substituent.) X is -CO-Y-R2, -Y-CO-R2, -NH-CO-Y-R2, -O-CO-NH-R2, -NH-CO-NH-R2, -SO2-Y-R2, -Y-SO2-R2, -O-SO2-R2, and -CO-O-CO-R2. Or -Y-R3 It is shown. Here, Y shows -O-, -S-, -NR4-, or single bond. However, X is -Y-R3. At the time, Y is not single bond.

Moreover, R2 and R3 And R4 A 20 or less total carbon number [which may have the hydrogen atom or the substituent] hydrocarbon group is shown independently, respectively.

[0327] The compound expressed with introduction and the (D) general formula (1) is explained. The inside of said general formula (1), and R1 Although a hydrocarbon group with 8-32 total carbon is shown, specifically, what has substituents, such as a halogen radical, a hydroxy group, a cyano group, and an amino group, is mentioned preferably. Moreover, you may have ether linkage, an ester bond, and amide association in the hydrocarbon group. However, these substituents and association are included and it is R1. It requires that the inner numbers of total carbon are 8-32. When the residual membrane depressor effect of the non-image section falls that the number of total carbon is less than eight and the number of total carbon exceeds 32, there is an inclination for the solubility over the developer of an image recording layer to fall. Desirable R1 The alkyl group which includes double bonds, such as branching alkyl group;9-octadecenyl radicals, such as straight chain alkyl group;14-methyl pentadecyl groups, such as a

decyl group, dodecyl, a hexadecyl radical, and an octadecyl radical, and 16-methyl heptadecyl radical, as an example; aryl groups, such as a nonylphenyl radical, etc. are mentioned.

[0328] Moreover, X is $-\text{CO}-\text{Y}-\text{R}_2$, $-\text{Y}-\text{CO}-\text{R}_2$, $-\text{NH}-\text{CO}-\text{Y}-\text{R}_2$, $-\text{O}-\text{CO}-\text{NH}-\text{R}_2$, $-\text{NH}-\text{CO}-\text{NH}-\text{R}_2$, $-\text{SO}_2-\text{Y}-\text{R}_2$, $-\text{Y}-\text{SO}_2-\text{R}_2$, $-\text{O}-\text{SO}_2-\text{R}_2$, and $-\text{CO}-\text{O}-\text{CO}-\text{R}_2$. Or $-\text{Y}-\text{R}_3$ It is shown. Here, Y shows $-\text{O}-$, $-\text{S}-$, $-\text{NR}_4-$, or single bond. However, X is $-\text{Y}-\text{R}_3$. At the time, Y is not single bond. In addition, R2 and R3 And R4 Although a 20 or less total carbon number [which may have the hydrogen atom or the substituent] hydrocarbon group is shown, as a desirable substituent which can be introduced, a halogen radical, a hydroxy group, a cyano group, the amino group, etc. are mentioned independently, respectively. Moreover, in said hydrocarbon group, you may have ether linkage, an ester bond, amide association, etc. Here, it is R2 and R3. And R4 As a desirable example, hydrocarbon groups, such as a hydrogen atom; methyl group, an ethyl group, n-butyl, i-butyl, sec-butyl, t-butyl, a hexyl group, a phenyl group, benzyl, a naphthyl group, and dodecyl, are mentioned.

[0329] Although the desirable example of a compound expressed with a general formula (1) is given to below, this invention is not limited to these. As a carboxylic acid (it sets to a general formula (1) and X is $-\text{COOH}$), enanthic acid, a caprylic acid, pelargonic acid, a capric acid, undecylic acid, a lauric acid, a tridecyl acid, a myristic acid, pentadecyl acid, a palmitic acid, a heptadecyl acid, stearin acid, a nonadecane acid, arachin acid, behenic acid, a lignoceric acid, a cerotic acid, a heptacosane acid, a montanoic acid, a melissic acid, a RAKUSERU acid, undecylenic acid, oleic acid, an elaidic acid, a cetoleic acid, an erucic acid, brassidic acid, etc. mentioned Moreover, as carboxylate (X is $-\text{COOR}$), the dodecyl ester of; (meta) acrylic acid or 4-styrene carboxylic acid, such as the methyl ester of said illustrated carboxylic acid, ethyl ester, propyl ester, butyl ester, dodecyl ester, phenyl ester, naphthyl ester, and allyl ester, hexadecyl ester, nonylphenyl ester, etc. are mentioned.

[0330] As thiocarboxylic-acid ester (X is $-\text{COSR}$), the methylthio ester of said illustrated carboxylic acid, ethyl thioester, propyl thioester, butyl thioester, benzyl thioester, etc. are mentioned. As carboxylic amide (X is $-\text{CONH}_2$ or $-\text{CONHR}$), dodecyl amides of; (meta) acrylic acid or 4-styrene carboxylic acid, such as an amide of said illustrated carboxylic acid, methylamide, an ethyl amide, and an allyl compound amide, a hexadecyl amide, a hexadecyl anilide, etc. are mentioned. As urethane or an urea derivative (X is $-\text{O}-\text{CO}-\text{NH}-\text{R}$ or $-\text{NH}-\text{CO}-\text{NH}-\text{R}$), the resultant of an octadecyl amine and 2-hydroxyethyl acrylate, the resultant of 2-methacryloiloxy-ethyl isocyanate and hexylamine, etc. are mentioned.

[0331] As alcohol (X is $-\text{OH}$), octyl phenol, nonyl phenol, A dodecyl phenol, 1-docosa Norian, a 1-hexenyl phenol, A phenol, an oxy-(2-ethylhexyl) phenol, (2-methyl-1-heptenyl) a dodecyloxy phenol, a dodeca noil oxy-phenol, and me -- an oil aminophenol -- Dodeca noil aminophenol, 2-hexyl cyclohexanol, N-octyl-2-hydroxy nicotinamide, 1-S-octyl-beta-D-thio glucopyranoside, sorbitan monolaurate, and N-dodeca noil-3-pylori JINORU etc. is mentioned. As a sulfonic-acid derivative (X is $-\text{SO}_2-\text{O}-\text{R}$ or $-\text{SO}_2-\text{NH}-\text{R}$), dodecylbenzenesulfonic acid phenyl ester, a nonane sulfonic-acid anilide, etc. are mentioned. In addition, aldehydes (X is $-\text{CO}-\text{H}$), such as cyclic anhydride (X is $-\text{CO}-\text{O}-\text{CO}-\text{R}$); 1-docosa NARU, such as a lactone [, such as gamma-DODEKANO lactone and 1-dodecyl-2-pyrrolidinone,] and lactam (X is $-\text{CO}-\text{O}-\text{R}$ or $-\text{CO}-\text{NH}-\text{R}$); 2-dodecen-1-IRUKOHAKU acid anhydride, are mentioned further. Also in these compounds, the compound which is a solid-state at a room temperature is desirable in respect of a coefficient-of-sliding-friction fall. Moreover, it is still more desirable from a viewpoint of the improvement in membraneous of an image recording layer to have the functional group in which a radical polymerization like an allyl group, an acryloyl (meta) radical, and a styryl radical is possible.

[0332] As an addition of the compound expressed with these general formulas (1), among image recording layer solid content, it is desirable that it is 0.001 - 10 mass %, and it is more desirable that it is 0.01 - 5 mass %. If there are few contents than 0.001 mass %, the residual membrane of the non-image section may be unable to be controlled, and if [than 10 mass %] more, the solubility over the developer of an image recording layer may fall, and neither is desirable.

[0333] The negative-mold image recording layer B-2 of this mode contains (A) radical generating agent (radical polymerization initiator) other than the above (D), and (B) radical polymerization

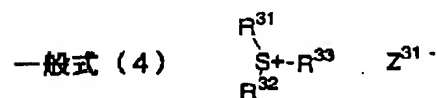
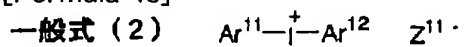
nature compound which causes a polymerization reaction by the generated radical and is hardened, and contains (C) infrared absorption agent and (E) binder polymer further preferably. In this image recording layer, in heating or an exposure field, radical polymerization initiators, such as (A) onium salt, decompose, and a radical is generated with heat. (B) A radical polymerization nature compound has the ethylene nature partial saturation double bond of a piece at least, it is chosen out of the compound which has preferably at least one end ethylene nature unsaturated bonds [two or more], and a polymerization reaction occurs continuously by the generated radical, it hardens and the image section is formed. Hereafter, the constituent of other image recording layers is explained.

[0334] (A) Explain a radical generating agent.

As a radical generating agent suitably used in this invention, an onium salt is mentioned and, specifically, iodonium salt, diazonium salt, and sulfonium salt are mentioned. Although these onium salts also have a function as an acid generator, in case it uses together with the radical polymerization nature compound mentioned later, they function as an initiator of a radical polymerization. The onium salt suitably used in this invention is an onium salt expressed with following general formula (2) - (4).

[0335]

[Formula 48]



[0336] Ar¹¹ and Ar¹² show independently the aryl group of 20 or less carbon atomic numbers which may have the substituent among a formula (2), respectively. As a desirable substituent in case this aryl group has a substituent, a halogen atom, a nitro group, the alkyl group of 12 or less carbon atomic numbers, the alkoxy group of 12 or less carbon atomic numbers, and the aryloxy group of 12 or less carbon atomic numbers are mentioned. Z¹¹ - The counter ion chosen from the group which consists of halogenide ion, perchloric acid ion, tetrafluoroborate ion, hexafluorophosphate ion, and sulfonic-acid ion is expressed, and they are perchloric acid ion, hexafluoro phosphate ion, and aryl sulfonic-acid ion preferably.

[0337] Formula (3) Ar²¹ shows the aryl group of 20 or less carbon atomic numbers which may have the substituent inside. As a desirable substituent, a halogen atom, a nitro group, the alkyl group of 12 or less carbon atomic numbers, the alkoxy group of 12 or less carbon atomic numbers, the aryloxy group of 12 or less carbon atomic numbers, the alkylamino radical of 12 or less carbon atomic numbers, the dialkylamino radical of 12 or less carbon atomic numbers, the arylamino radical of 12 or less carbon atomic numbers, and the diaryl amino group of 12 or less carbon atomic numbers are mentioned. Z²¹ - is Z¹¹. - The counter ion of homonymy is expressed.

[0338] R³¹, R³², and R³³ show independently the hydrocarbon group of 20 or less carbon atomic numbers which may have the substituent among a formula (4), respectively. As a desirable substituent, a halogen atom, a nitro group, the alkyl group of 12 or less carbon atomic numbers, the alkoxy group of 12 or less carbon atomic numbers, and the aryloxy group of 12 or less carbon atomic numbers are mentioned. Z³¹ - Z¹¹ - The counter ion of homonymy is expressed.

[0339] In this invention, what is indicated by paragraph number [of a Japanese-Patent-Application-No. No. 310623 / 11 to / specification (JP,2001-133969,A)] [0030] - [0033] can be mentioned as an example of the onium salt which can be used suitably.

[0340] As for the onium salt used in this invention, it is desirable that absorption maximum wavelength is 400nm or less, and it is more desirable that it is 360nm or less. Thus, the handling [the lithography version original edition] under a white light by making absorption wavelength into an ultraviolet-rays field.

[0341] these onium salts -- the total solids of image recording layer coating liquid -- receiving -- 0.1 to 50 mass % -- desirable -- 0.5 to 30 mass % -- especially, 1 - 20 mass % can come out comparatively preferably, and it can add in image recording layer coating liquid. If sensibility becomes it low that an addition is under 0.1 mass % and 50 mass % is exceeded, dirt will be generated in the non-image section at the time of printing. Only one sort may be used for these onium salts, and they may use two or more sorts together. Moreover, you may add in the same layer as other components, and these onium salts may prepare another layer and may add it there.

[0342] (B) Explain a radical polymerization nature compound.

The radical polymerization nature compound used for the image recording layer B-2 is a radical polymerization nature compound which has the ethylene nature partial saturation double bond of a piece at least, and is chosen from the compound which has preferably at least one end ethylene nature unsaturated bonds [two or more]. Such a compound group is widely known in the industrial field concerned, and can be used, without limiting these especially in this invention. These have the chemical form of a monomer, prepolymers (namely, a dimer, a trimer, and oligomer), those mixture, those copolymers, etc. As an example of a monomer and its copolymer, unsaturated carboxylic acid (for example, an acrylic acid, a methacrylic acid, an itaconic acid, a crotonic acid, isocrotonic acid, a maleic acid), and the ester and amides are mentioned, and the ester of unsaturated carboxylic acid and an aliphatic series polyhydric-alcohol compound and the amides of unsaturated carboxylic acid and an aliphatic series multiple-valued amine compound are mentioned preferably. Moreover, a dehydration condensation reaction object with the carboxylic acid of the addition reaction object of the unsaturated-carboxylic-acid ester or the amides which has nucleophilicity substituents, such as a hydroxy group, an amino group, and a sulfhydryl group, and the isocyanates of monofunctional or many organic functions or epoxy, monofunctional, or many organic functions is also used suitably. Moreover, the addition reaction object of the unsaturated-carboxylic-acid ester or the amides which has electrophile nature substituents, such as an isocyanate radical and an epoxy group, and the alcohols of monofunctional or many organic functions, amines or thiols; the substitution reaction object of the unsaturated-carboxylic-acid ester or the amides which has desorption nature substituents, such as a halogen radical and a tosyloxy radical, and the alcohols of monofunctional or many organic functions, amines or thiols is also used suitably. Moreover, the compound group replaced with partial saturation phosphonic acid, styrene, etc. can also be used instead of the above-mentioned unsaturated carboxylic acid as another example.

[0343] The example of the acrylic ester which is the radical polymerization nature compound which is ester of an aliphatic series polyhydric-alcohol compound and unsaturated carboxylic acid, methacrylic ester, itaconic-acid ester, crotonic-acid ester, isocrotonic acid ester, and a maleate is indicated by paragraph number [of a Japanese-Patent-Application-No. No. 310623 / 11 to / specification (JP,2001-133969,A)] [0037] - [0042], and can apply these also to this invention.

[0344] What has the aromatic series system frame of a publication as an example of other ester in fatty alcohol system ester given in JP,46-27926,B, JP,51-47334,B, and JP,57-196231,A, JP,59-5240,A and JP,59-5241,A, and JP,2-226149,A, the thing which contains the amino group of a publication in JP,1-165613,A are used suitably.

[0345] Moreover, the urethane system addition polymerization nature compound manufactured using the addition reaction of an isocyanate radical and a hydroxyl group is also suitable, and the vinyl urethane compound containing two or more polymerization nature vinyl groups is mentioned as such an example into 1 molecule to which the vinyl monomer which contains the hydroxyl

group shown by the following general formula (5) to the poly isocyanate compound which has two or more isocyanate radicals in one molecule indicated by JP,48-41708,B was made to add.

[0346]

$\text{CH}_2=\text{C}(\text{R}_{41})\text{COOCH}_2\text{CH}(\text{R}_{42})\text{OH}$ General formula (5) (however, R_{41} and R_{42} show $-\text{H}$ or $-\text{CH}_3$.)

[0347] About these radical polymerization nature compounds, the detail of operation how whether it is used independently, using what kind of structure or it using together, and an addition are can be set as arbitration in accordance with the engine-performance design of a final record ingredient. For example, it is chosen from the following viewpoints. In respect of sensibility, structure with many partial saturation radical contents per molecule is desirable, and when it is many, two or more organic functions are desirable. Moreover, in order to make high reinforcement of the image section, i.e., the hardening film, the thing of three or more organic functions is good, and the approach of adjusting both photosensitivity and reinforcement by using combining the compound (for example, an acrylic ester system compound, a methacrylic ester system compound, a styrene system compound) which has the different number of organic functions and a different different polymerization nature machine also has it. [still more effective] While the compound of big molecular weight and a hydrophobic high compound are excellent in sensibility or film reinforcement, they may not be desirable in respect of a deposit in development speed or a developer. Moreover, also to other compatibility and dispersibility with a component (for example, a binder polymer, an initiator, a coloring agent) in an image recording layer, selection and the usage of a radical polymerization compound are important factors, for example, according to use of a low purity compound, and concomitant use of a two or more sort compound, it may raise compatibility and it may deal in it. Moreover, specific structure can be chosen for the purpose which makes adhesion, such as a base material and an overcoat layer, improve. About the compounding ratio of the radical polymerization nature compound in an image recording layer, although more ones are advantageous in sensibility, when many [too], the phase separation which is not desirable arises or problems, like the problem on the production process by the adhesiveness of an image recording layer (for example, the poor manufacture originating in the imprint of a recording layer component and adhesion) and the deposit from a developer arise may be produced.

[0348] From these viewpoints, in many cases, the desirable compounding ratio of a radical polymerization nature compound is five to 80 mass % to all constituent components, and is 20 to 75 mass % preferably. Moreover, these may be used independently or may be used together two or more sorts. In addition, the usage of a radical polymerization nature compound can choose suitable structure, combination, and an addition as arbitration from viewpoints, such as size of the polymerization inhibition to oxygen, resolution, fogging nature, refractive-index change, and surface adhesiveness, and can also enforce an under coat, and the lamination and the method of application which are called finishing further depending on the case.

[0349] (C) Explain a light absorption agent.

Since this invention induces an ultraviolet radiation line, a visible ray, or an infrared light line and performs image formation, it is desirable to contain a light absorption agent in an image recording layer. The light absorption agent used in this invention is a compound which absorbs ultraviolet rays, the light, or infrared radiation, and generates a radical by combining with a radical generating agent. As such a combination, an acetophenone system, a benzoin system, a benzophenone system, and a thioxanthone system are mentioned to an ultraviolet region as an initiator which shows sensibility, for example.

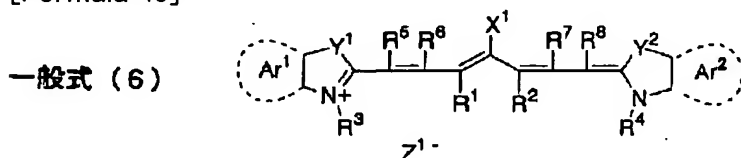
[0350] moreover, as an initiator which shows sensibility to a light region For example, combination of organic peroxide and chlorophyll, combination of organic peroxide and eosine G, The combination of organic peroxide and a riboflavin, the combination of organic peroxide and a methylene blue, Organic peroxide (thio) Combination with pyrylium salt, combination of organic peroxide and merocyanine, The combination of organic peroxide and a quinoline, the combination of organic peroxide and a styryl quinone, Organic peroxide (thio) Combination with a xanthene dye, combination of organic peroxide and riboflavin tetra-butyrate, Organic peroxide (keto) Combination with coumarin system coloring matter, combination of organic peroxide, N-

phenylglycine, and thoxanthene system coloring matter, The combination of a diphenyliodonium salt and merocyanine coloring matter, the combination of a diphenyliodonium salt and a rhodanine derivative polymer, The combination of a diphenyliodonium salt and keto coumarin system coloring matter, the combination of a diphenyliodonium salt and tetra-phenyl porphyrin system coloring matter, The combination of a diphenyliodonium salt and a tetra-benzoporphyrin, the combination of a diphenyliodonium salt and a SUPIRO pyran, [0351] The combination of a diphenyliodonium salt, N-phenylglycine, and thoxanthene system coloring matter, The combination of a diphenyliodonium salt, N-phenylglycine, and merocyanine system coloring matter, The alkyl borate of cyanine system coloring matter and cyanine system coloring matter, the alkyl borate of rhodamine system coloring matter, The combination of the alkyl borate of methylene-blue system coloring matter, an iron arene complex, an iron arene complex, and keto coumarin system coloring matter, The combination of an iron arene complex and thoxanthene system coloring matter, fluorine permutation titanocene, The combination of a bis-imidazole and an ARIRIRI DIN aryl ketone, The combination of a bis-imidazole and keto coumarin system coloring matter, the combination of N-phenylglycine and keto coumarin system coloring matter, N-phenylglycine (thio) Combination with a xanthene dye, The combination of a tris (TORIKURORO methyl)-s-triazine derivative, a tris (TORIKURORO methyl)-s-triazine derivative, and merocyanine system coloring matter, The combination of a tris (TORIKURORO methyl)-s-triazine derivative and keto coumarin system coloring matter, The combination of a tris (TORIKURORO methyl)-s-triazine derivative and thio pyrylium salt, The combination of a tris (TORIKURORO methyl)-s-triazine derivative and thoxanthene system coloring matter, the combination of aminobenzoic-acid ester and riboflavin tetra-butyrate, and the combination of 2-mercapto benzimidazole and thio pyrylium salt are mentioned. Furthermore, as an initiator which has sensibility, the combination of the salt of near-infrared region absorptivity cationic dye, and a near-infrared region absorption cationic color and ammonium salt and the combination of near-infrared region absorptivity cationic dye, a triazine compound, and ammonium salt are mentioned to a near-infrared region, for example.

[0352] When recording the image recording layer of the image recording ingredient concerning this invention by the laser which emits infrared radiation, it is desirable from a viewpoint of the improvement in sensibility to add the light absorption agent which has the function to change into heat the infrared light used for exposure. The pigment and color which were indicated to "(C) Compound which absorbs light and generates heat" used for the image recording layer A-1 mentioned above as such a light absorption agent are mentioned. As a desirable thing, cyanine dye, SUKUWARIRIUMU coloring matter, pyrylium salt, and a nickel thio rate complex are especially mentioned among these colors. Furthermore, cyanine dye is desirable and the cyanine dye shown especially by the following general formula (6) is the most desirable.

[0353]

[Formula 49]



[0354] The inside of a general formula (6), and X1 A halogen atom and -X2-L1 Or -NL 2L3 It is shown. Here, it is X2. An oxygen atom or a sulfur atom is shown and it is L1. The hydrocarbon group of the carbon atomic numbers 1-12 is shown, and it is L2. And L3 The hydrocarbon group of the carbon atomic numbers 1-12 is shown independently, respectively. R1 And R2 The hydrocarbon group of the carbon atomic numbers 1-12 is shown independently, respectively. The preservation stability of recording layer coating liquid to R1 And R2 It is desirable that it is the hydrocarbon group of two or more carbon atomic numbers, and it is R1 further. As for R2, it is desirable to join together mutually and especially to form five membered-rings or six membered-rings. Ar1 And Ar2 The aromatic hydrocarbon radical which may have the substituent is shown independently, respectively. Y1 And Y2 The dialkyl methylene group of a sulfur atom or 12 or

less carbon atomic numbers is shown independently, respectively. R3 And R4 The hydrocarbon group of 20 or less carbon atomic numbers which may have the substituent is shown independently, respectively. As a desirable substituent, the alkoxy group of 12 or less carbon atomic numbers, a carboxyl group, and a sulfonic group are mentioned. R5, R6, and R7 And R8 A hydrogen atom or the hydrocarbon group of 12 or less carbon atomic numbers is shown independently, respectively. From the availability of a raw material, it is desirable that it is a hydrogen atom. Moreover, Z1- shows an opposite anion. However, R1 -R8 Z1- is unnecessary when the sulfonic group is permuted by either. Desirable Z1- is the halogenide ion from preservation stability, the perchloric acid ion, the tetrafluoroborate ion, hexafluorophosphate ion, and sulfonic-acid ion of recording layer coating liquid, and is perchloric acid ion, hexafluoro phosphate ion, and aryl sulfonic-acid ion especially preferably.

[0355] In this invention, what was indicated by paragraph number [of a Japanese-Patent-Application-No. 11-No. 310623 specification (JP,2001-133969,A)] [0017] - [0019] can be mentioned as an example of the cyanine dye shown by the general formula (6) which can be used suitably.

[0356] 0.1 - 10 mass % is more desirable, and when it is a color further, 0.5 - 10 mass % is the most desirable, and when it is a pigment, 1.0 - 10 mass % is the most desirable [as a content of the above-mentioned color in an image recording layer, or a pigment, 0.01 - 50 mass % is desirable to the total-solids mass of an image recording layer, and]. When sensibility may become low when said content is under 0.01 mass %, and 50 mass % is exceeded, dirt may be generated in the non-image section at the time of considering as the original edition for lithography.

[0357] (E) Explain a binder polymer.

In this invention, it is desirable from a viewpoint of the improvement in membraneous to add a binder polymer further in the image recording layer B-2. as a binder -- a line -- it is desirable to use an organic polymer. such -- " -- a line -- anything may be used as organic polymer." the line which is fusibility or bloating tendency to water or the weak alkaline water in order to enable water development or weak alkaline-water development preferably -- an organic polymer is chosen. a line -- according to the application as water, the weak alkaline water, or an organic solvent developer, selection use of the organic polymer is carried out only as a coat formation agent for forming an image recording layer. For example, water development is attained when using a water-soluble organic polymer. such a line -- there are what is indicated by the radical polymerization object which has a carboxylic-acid radical in a side chain, for example, JP,59-44615,A, JP,54-34327,B, JP,58-12577,B, JP,54-25957,B, JP,54-92723,A, JP,59-53836,A, and JP,59-71048,A as an organic polymer, i.e., a methacrylic-acid copolymer, an acrylic-acid copolymer, an itaconic-acid copolymer, a crotonic-acid copolymer, a maleic-acid copolymer, a partial esterification maleic-acid copolymer, etc. Moreover, the acid cellulosic which has a carboxylic-acid radical is in a side chain similarly. In addition, the thing which made the cyclic anhydride add to the polymer which has a hydroxyl group is useful.

[0358]

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